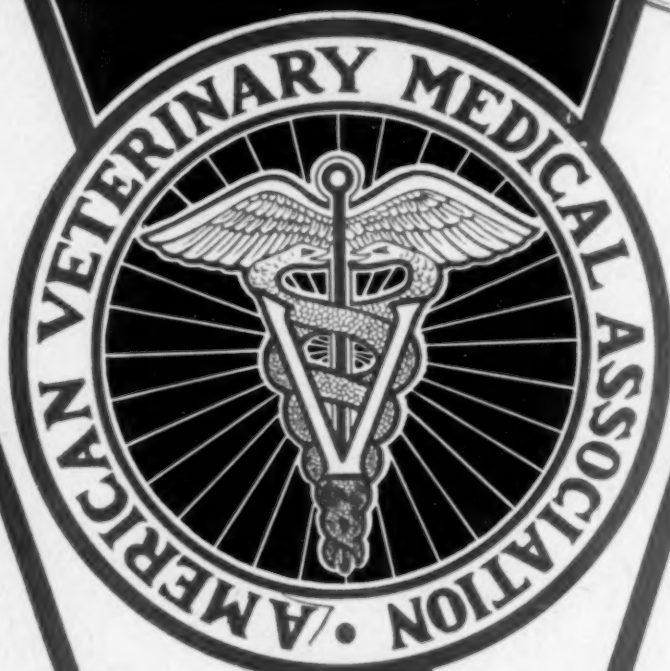


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The
nation's
economic
heart

HAS NO SIZEABLE SURPLUS OF FOOD

Economists of Cornell Agricultural College warn that our main food reserves are only sufficient to feed the United Nations for three weeks, contrary to the boastful and unsupported guessing of two years ago, and

the Department of Agricultural Economics, University of Illinois, points out (*Atlantic Monthly*, Dec. 1944) that the present margin between abundance and hunger stems largely from seven years of unusually high yields of grain turned into meat, milk, eggs, and poultry.

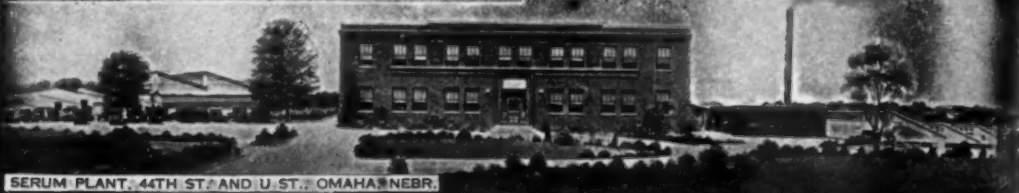
HAVING CLOSE AND ACCURATE
KNOWLEDGE OF THESE FACTS IN
THE PURSUIT OF THEIR WORK,
VETERINARIANS ARE GIVING
FULL MEASURE OF THEIR TIME
AND TALENT TOWARD PRESERVA-
TION AND CONSER-
VATION OF ANIMAL
RESOURCES.



HOME OFFICES AND BIOLOGICAL
LABORATORIES, OMAHA, NEBR.



SERUM PLANT, RALSTON, NEBR.



SERUM PLANT, 44TH ST. AND U ST., OMAHA, NEBR.

The Corn States Serum Co.
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The Newer Sulfonamides in Veterinary Practice

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THE USE OF sulfonamides in human medicine has encouraged veterinarians, both in practice and research, to determine their usefulness in veterinary medicine. It is the problem of the research worker to separate the sulfonamides of possible practical value from those of little or no value. It has been stated that 1,300 new sulfonamides have been developed from sulfanilamide; however, relatively few have been used extensively.

The first consideration in the use of any new drug is its therapeutic efficiency and toxicity in controlled experiments. These properties should be considered from many angles, since in veterinary medicine we do not always have ideal conditions under which to use new sulfonamides. Among the sulfonamides, sulfanilamide is most widely used, being given orally, intraperitoneally, and topically. Sulfathiazole has recently come into more general use, being administered orally and intravenously for many diseases (pneumonia, septicemia, wound infections), and post-operatively. Those drugs, other than sulfanilamide, which have shown the most possibilities as therapeutic agents for the common livestock diseases are sulfapyridine, sulfathiazole, sulfadiazine, sulfamerazine, sulfaguanidine, sulfasuxidine, and sulfathalidine. In human medicine, each of these drugs has cer-

tain advantages over sulfanilamide. Not all are applicable to veterinary medicine.

MODE OF ACTION OF THE SULFONAMIDES

The sulfonamides are considered by most investigators as bacteriostatics. Woods¹ suggests that para-aminobenzoic acid, which is similar in chemical structure to sulfanilamide, is an essential growth substance of many bacteria and is probably synthesized by the bacterial cell. The enzyme activity of the bacterial cell, necessary for its utilization of para-aminobenzoic acid, is associated with the bacteriostatic effect of the sulfanilamide-like compounds on organisms. Briefly, because of the similarity in chemical structure of the two compounds, the sulfonamide competes with the para-aminobenzoic acid for a position in this enzymatic reaction.

When sufficient active sulfonamide is present to displace the para-aminobenzoic acid, it inhibits the growth of the bacterial cell. However, according to the law of mass action, if an excess of the para-aminobenzoic acid is present, sulfanilamide is displaced and the bacterial growth is unimpeded. This is also substantiated by the fact that the use of local anesthetics with a free para-amino group will have an effect on the therapeutic action of the sulfonamides since compounds of this type, like procaine, break down in the tissue to para-aminobenzoic acid and may inhibit sulfonamide action.

TOXICITY

Many of the sulfonamides are potentially dangerous drugs, but early serious toxic

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effects are usually avoided by exercising certain fundamental precautions in the administration of these compounds. Many factors may influence their toxicity. Most important are the rate of absorption and excretion, and the amount of conjugation or acetylation which takes place in the blood and body tissues. Another condition which may have a definite effect on the toxicity of a sulfonamide compound is the relative degree of dehydration of the body, an important factor in the elimination of sulfonamides by the kidneys.

The sulfonamides can be divided into two groups: First, those which are readily absorbed and produce a significant blood concentration in a relatively short time, and thereby exert their therapeutic action by a maintenance of this blood concentration. These are sulfanilamide, sulfapyridine, sulfathiazole, sulfadiazine, and sulfamerazine. The second group, consisting of sulfaguanidine, sulfasuxidine, and sulfathalidine, which are not readily absorbed from the gastrointestinal tract, act as bacteriostatics on the intestinal flora. These compounds are not appreciably absorbed into the blood even when given in excessive doses. Sulfaguanidine, given in three to four times the therapeutic dose, will produce a very severe nephritis resulting in uremic poisoning even though a relatively low blood concentration is attained. Blood studies with sulfasuxidine and sulfathalidine show very little absorption indicated by a low blood concentration even when extremely high doses are administered. When the blood concentration of sulfaguanidine rises above 6.0 mg. per cent, there is a crystallization of the drug in the kidneys, due to the normal concentration of fluids in the tubules.

Toxicity studies made on a large number of calves given excessive dosages of these drugs indicate that the calf will tolerate sulfathiazole to a greater extent than it will sulfapyridine, sulfadiazine, and possibly sulfamerazine. In therapeutic dosages, there is little difference from a toxicity standpoint. Sulfadiazine appears to have some of the tendencies of sulfapyridine, one of which is a crystallization in the kidneys when large dosages are given.

SULFONAMIDE THERAPY

The development of various sulfonamides has led us to seek new uses for them in veterinary practice. In a number of dis-

eases, their use by veterinarians has been practical and successful while in other conditions they have met with moderate to no success. Some reports are based solely upon clinical observations. In our studies, we have attempted to determine toxicity by the use of excessive doses and the prolonged administration of the therapeutic dose to normal animals. The therapeutic efficiency of the drug is important and can be determined only by the use of varying doses in clinical cases.

Sulfathiazole has been used for many infectious conditions. Reports of its experimental use and therapeutic effect in staphylococci and *Escherichia coli* infections have shown it to be far superior to sulfanilamide and sulfapyridine. Blood studies show that sulfathiazole is more readily excreted from the body and not as easily acetylated or conjugated by the body tissues or fluids as is sulfanilamide or sulfapyridine. More frequent administration of this drug is necessary because of its rapid elimination from the blood.

Thirty-three cases of calf pneumonia were treated with sulfathiazole, as shown in table 1. Clinical observations on these calves, in addition to chemical studies on the blood and urine, indicate that sulfathiazole has a definite place as a treatment for this type of infection. No toxic effects have been observed in the use of this drug for calf pneumonia. Of the 33 animals treated, 29 showed a rapid recovery, 2 responded slowly, and 2 succumbed to the disease. Those which showed the most rapid recovery were given the drug early in the disease. Based upon toxicity studies with normal calves and clinical cases of calf pneumonia, sulfathiazole should never be given in doses of more than 3.5 gr. per pound of body weight. However, it is seldom necessary to administer this much. Calves weighing 50 lb. or under should not receive more than 1.0 gr. per pound of body weight.

Herriot and Biltz³, judging from clinical observations, reported sulfathiazole as giving good results when used for feeder cattle which had shipping fever or pneumonia. They used 1.0 gr. per pound of body weight *per os*, following an intravenous dose of 38.6 gr. of sulfathiazole sodium sesquihydrate in 50 cc. of distilled water for each 100 lb. of body weight. It has also been

used successfully for pneumonia in horses when given orally and intravenously.

Sulfathiazole has been used extensively in dogs for mixed infections and septicemias at the rate of 1.0 gr. per pound of body weight per day. In controlled experiments and under clinical conditions, it has been used with encouraging results by Delaplane and Stuart³ for the prevention and treatment of coryza in chickens.

Sulfadiazine has not been used in veterinary practice as extensively as sulfathiazole. It has been used on a small number of cases of calf pneumonia with favorable results as judged by clinical observations (table 2). Eleven of the 12 calves with pneumonia treated with this drug made a good recovery. One calf died from a chronic bronchopneumonia with extensive abscess formation and necrosis of the lung tissue. Toxicity studies, using various experimental doses on 6 normal calves, have shown that they will not tolerate as high a dose of sulfadiazine as of sulfathiazole. When sulfadiazine was given in therapeutic doses,

it was readily eliminated from the body. Dose for dose, it has about the same therapeutic value as sulfathiazole, although recoveries did not appear to be as rapid as when sulfathiazole was used.

Sulfamerazine is the most recent addition to this group of sulfonamides which show possibilities as a treatment for infectious diseases in livestock. It has been reported as being therapeutically similar to sulfadiazine. However, it possesses some characteristics which are of a distinct advantage in veterinary practice. These are, namely: a more rapid and complete absorption from the digestive tract, the attainment of a higher blood concentration more rapidly on equal oral doses, the same blood concentration as sulfadiazine on one half the dose and, most important, proper blood concentrations are maintained with less frequent oral doses than with the other sulfonamides. Sulfamerazine was used on a number of cases of calf pneumonia and on the basis of clinical observations it was found satisfactory (table 3). No toxic ef-

Table 1—Showing Dosages and Results When Sulfathiazole Was Given to Clinical Cases of Calf Pneumonia

DATE	CALF	WEIGHT (LB.)	DAILY DOSES IN GRAMS					RESULTS
			ONE	TWO	THREE	FOUR	FIVE	
11/20/42	3148	122	8.5	8.5	4.5	4.0	3.0	Good
11/27/42	3137	175	13.0	13.0	5.5	3.0	3.0	Good
11/27/42	3154	117	3.0	9.0	7.5	7.5	4.5	Fair
11/27/42	3147	140	3.0	10.5	8.5	4.5	4.5	Fair
11/27/42	3174	60	3.5	3.5	3.5	3.5	..	Fair
11/27/42	3179	98	6.0	6.0	3.0	..	..	Good
1/13/43	3186	75	5.0	4.5	3.0	..	..	Good
1/18/43	3187	80	5.0	5.0	3.0	..	..	Good
1/28/43	3194	100	2.5	4.0	4.0	3.0	3.0	Poor
2/5/43	3167	83	6.0	6.0	4.5	3.0	3.0	Good
2/5/43	3174	80	6.0	6.0	4.5	..	..	Good
2/11/43	3185	125	3.0	9.0	7.5	..	..	Fair
2/11/43	3186	83	2.0	6.0	5.5	..	..	Good
2/15/43	3202	90	6.0	6.0	3.0	3.0	..	Good
2/23/43	3191	100	5.0	7.0	6.0	4.0	..	Good
2/26/43	3196	76	9.0	9.0	6.0	6.0	..	Good
3/3/43	3191	117	2.0	7.5	7.5	6.0	4.5	Fair*
3/3/43	3204	100	6.5	6.5	3.5	3.5	..	Good
3/30/43	3210	..	3.5	..	..	..	..	Died
4/5/43	3212	50	2.5	2.5	1.5	1.5	..	Good
4/12/43	3211	90	5.0	5.0	3.0	2.0	..	Good
4/13/43	3212	..	2.0	2.0	2.0	1.5	..	Died
4/23/43	M. C.	321	16.0	24.0	12.0	6.0	..	Good
5/5/43	3217	110	7.5	7.5	3.0	3.0	..	Good
5/26/43	3244	95	6.0	6.0	4.5	3.0	..	Good
6/18/43	3234	60	5.0	5.0	2.0	2.0	..	Good
8/9/43	3268	120	15.0	15.0	7.5	7.5	..	Good
9/4/43	3275	114	8.0	8.0	3.0	3.5	..	Good
9/5/43	3274	95	7.5	7.5	3.0	3.0	..	Good
10/13/43	3273	154	3.5	10.5	6.0	6.0	..	Good
10/29/43	3275	150	11.0	11.0	11.0	5.0	5.0	Fair*
11/2/43	3276	200	15.0	15.0	7.5	7.5	..	Good

*Necessary to repeat dosage after four days.

fects were observed upon the administration of 1.0 gr. per pound of body weight; however, a rather high blood concentration was obtained in calves with this dosage. In several calves upon which blood studies were made, concentrations of from 6 to 8 mg. per cent of total drug was reached. No studies have been made with calves

and for coccidiosis in poultry, sheep, and cattle. Sulfaguanidine has been used more as a preventive and treatment for coccidiosis in poultry⁴ and livestock⁵ than sulfasuxidine or sulfathalidine. The reports by Kernkamp and Roepke⁶ indicate that this drug is a satisfactory treatment for enteritis in swine.

Table 2—Showing Dosages and Results When Sulfadiazine Was Given to Clinical Cases of Calf Pneumonia

DATE	CALF	WEIGHT (LB.)	DAILY DOSES IN GRAMS					RESULTS
			ONE	TWO	THREE	FOUR	FIVE	
12/15/42	3152	118	10	10	4.5	4.5	3	Good
12/18/42	3165	70	5	5	3.5	3.5	..	Good
12/19/42	3143	170	8	12	8.0	6.0	..	Good
12/22/42	3167	49	2.5	2.5	2.5	1.5	..	Died
12/24/42	3154	117	9	9	9	9	4.5	Good
12/24/42	3156	92	6	6	6	3	2	Good
12/24/42	3162	96	6	6	3	3	2	Good
12/26/42	3137	175	13	13	3.5	..	..	Good
12/26/42	3141	105	7.5	7.5	7.5	..	..	Good
1/2/43	3179	98	6	6	3	3	..	Good
1/3/43	3164	70	5	5	3.5	3.5	3	Good
1/6/43	3178	76	5	5	2	2	1.5	Good

* weighing more than 100 lb. but, on the basis of work with other sulfonamides, it is possible that the dose may be reduced.

Sulfaguanidine was one of the first sulfonamides used for intestinal diseases with any degree of success. This is due mainly to the fact that it is not readily absorbed, thereby permitting a high concentration to be maintained in the intestinal tract without producing any serious toxic reactions. It has been used extensively for infectious enteritis in swine, calf scours,

Studies on sulfaguanidine, in which 21 normal calves were used as experimental animals, indicated that in proper dosage this drug was beneficial as a treatment for calf scours. Sulfaguanidine was found to be conjugated to the same percentage in the blood and urine regardless of the dosage. No evidence of conjugation could be found in the feces in either normal or scouring calves. On the therapeutic level of dosage, 95 per cent of the ingested sulfaguanidine was recovered in the excreta.

Table 3—Showing Dosages and Results When Sulfamerazine Was Given to Clinical Cases of Calf Pneumonia

DATE	CALF	WEIGHT (LB.)	DAILY DOSES IN GRAMS					RESULTS
			ONE	TWO	THREE	FOUR	FIVE	
3/23/44	3325	50	7.5	7.5	7.5	4.5	3	Good
3/27/44	3386	72	3.5	3.5	2	2	2	Good
4/13/44	3375	80	4	4	2.5	2.5	2.5	Good
4/13/44	3389	55	1.2	2.5	2.5	1.5	1.5	Died
4/13/44	3310	174	8	8	4	..	..	Died
4/26/44	3392	80	4	4	4	2.5	1.5	Fair
5/1/44	3399	100	5	5	5	2	2	Fair
5/19/44	3400	90	4.5	4.5	4.5	1.5	1.5	Fair
3/13/44	3391	60	4	4	2.5	2.5	..	Fair
5/12/44	3391	110	2	5.5	5.5	2.5	2.5	Good
6/7/44	3406	100	5	5	5	2	2	Good
6/15/44	3410	100	5	5	5	2	2	Good
6/19/44	3418	60	3	3	3	1.5	1.5	Good
6/27/44	3393	100	5	5	5	2	2	Good
6/27/44	3394	100	5	5	5	2	2	Good
6/28/44	3425	60	3	3	3	1.5	1.5	Good

This confirms an earlier report based upon clinical and experimental dosages⁷.

Sulfasuxidine and sulfathalidine have been administered to a number of normal experimental calves and to clinical cases of calf scours. Six normal calves were used for toxicity studies on sulfasuxidine and 7 for sulfathalidine. There was very little rise in the blood concentration of either of these sulfonamides upon increasing the dose five fold. There was slightly more absorption of sulfathalidine than there was of sulfasuxidine, although there was little difference in the blood concentration. The increased absorption was evidenced by an increased drug concentration in the urine, instead of in the blood. This indicates that any excess absorption of sulfathalidine over sulfasuxidine was readily eliminated. No toxic manifestations were observed when large doses were given. The administration of these drugs

of calf scours of average severity, one-fourth the dose of sulfasuxidine, given as sulfathalidine, produced good results. Seventy-five cases of calf scours, representing all age groups but essentially very young calves, have been treated with sulfathalidine during the last nine months. The results with a representative number of these are shown in table 4. The dose averaged from 0.7 gr. to 1.8 gr. per pound. Seven of the calves did not respond to treatment and died from the disease.

Sulfathalidine has been used as an intrauterine treatment following the removal of retained placenta in 12 different cases with a dose ranging from 20 to 50 Gm. A preliminary blood study indicates that absorption is not great. Clinical observations by practitioners indicate good results when used alone or in addition to an oral dose of sulfanilamide or sulfathiazole.

Sulfathalidine was used alone and in

Table 4—Showing Dosages and Results on a Representative Number of Clinical Cases of Calf Scours Which Were Given Sulfathalidine

DATE	CALF	WEIGHT (LB.)	DAILY DOSES IN GRAMS			RESULTS
			ONE	TWO	THREE	
11/11/43	3307	50	6	6	6	Died
11/13/43	3309	62	8	8	6	Good
11/19/43	3311	85	10	10	10	Good
11/21/43	3313	100	12	12	12	Good
12/2/43	3320	58	7	7	7	Good
12/8/43	3323	50	6	6	6	Died
12/14/43	3328	78	10	10	10	Good
1/13/44	3349	55	6	6	6	Poor
1/17/44	3351	90	11	11	11	Good
2/9/44	3359	90	11	11	11	Died
2/12/44	Calf of 685	105	13	13	13	Good
2/20/44	3370	90	11	11	11	Good
2/21/44	3369	55	5	5	5	Good
3/23/44	3388	80	10	10	10	Good
4/18/44	3395	60	8	8	8	Good
4/25/44	3396	110	13	13	13	Good
4/30/44	3403	100	12	13	13	Good

produced a marked change in the bacterial flora of the gastrointestinal tract, probably by inhibiting their growth and normal metabolic processes.

A comparative study of sulfasuxidine and sulfathalidine was made by employing various dosages in normal calves and in clinical cases of calf scours⁸. This work indicated that a dose of sulfathalidine, one-fourth that of sulfasuxidine, will produce the same reduction of the coliform organisms. Both of these drugs appeared to have more effect on the coliform organisms in the gastrointestinal tract than sulfaguanidine. In treating clinical cases

in conjunction with niacin and brewers' yeast as a treatment for a herd of young, unthrifty pigs showing clinical symptoms of swine dysentery or enteritis. Clinical observations indicated the best results in the group which received both the B vitamins and sulfathalidine.

A comprehensive study is being made with chickens regarding the toxicity of sulfanilamide, sulfapyridine, sulfathiazole, sulfadiazine, and sulfamerazine. Indications are that sulfathiazole is the least toxic, followed by sulfamerazine, while sulfanilamide and sulfapyridine are the most toxic. The sulfonamides are more slowly

and irregularly absorbed by the chicken than by the calf and hog.

RELATIONSHIP TO VITAMINS

Various reports based upon synthetic diets have indicated that the sulfonamides which are poorly absorbed from the gastro-

calves were born during the calving period Dec. 1, 1943, to July 1, 1944, vitamins A, B, and C were administered in prescribed amounts to all calves soon after birth. This procedure lowered the incidence and, on the basis of clinical observations, the severity of that type of scours which occurs in

Table 5—Showing Dosages Which Have Been Used for Sulfathiazole, Sulfadiazine, and Sulfamerazine

SULFONAMIDE	DISEASE	ANIMAL	AVE. NO. DAYS ADM.	INITIAL INTRA- VENOUS DOSES	DAILY ORAL DOSE	REMARKS
Sulfathiazole	Pneumonia	Calf	5		1-1.5 gr./lb.	Reduce by $\frac{1}{2}$ on third day
Sulfathiazole	Pneumonia	Sheep	5-6		1 gr./lb.	
Sulfathiazole	Pneumonia	Horse	4-5	500 cc. 5% sodium sulfathiazole	1 oz. at 6 hr. intervals*	Reduce to $\frac{1}{4}$ oz. on second day
Sulfathiazole	Pneumonia	Dog	5-8		1 gr./lb.	Reduction based on progress
Sulfathiazole	Septicemia	Dog	5-8		1 gr./lb.	Reduction based on progress
Sulfathiazole	Septicemia	Cattle	4-5	38 gr. in 50 cc. dist. water per 100 lbs. wt.	1 gr./lb.	Until recovery
Sulfathiazole	Coryza	Chicken	3-5		22.5 gr./oz. of mash	
Sulfadiazine	Pneumonia	Calf	4-5		1 gr./lb.	Reduce by $\frac{1}{2}$ on third day
Sulfadiazine	Pneumonia	Dog	5-6		1 gr./lb.	
Sulfamerazine	Pneumonia	Calf	5		$\frac{3}{4}$ -1 gr./lb.	
Sulfamerazine	Influenza-like infection	Dog	5-8		1 gr./lb.	
Sulfamerazine	Distemper Respiratory	Cat	5-8		1 gr./lb.	

*Used sulfanilamide as oral dosage.

intestinal tract, such as sulfaguanidine, sulfasuxidine, and sulfathalidine, may reduce the number of coliform and possibly other microorganisms responsible for the synthesis of biotin, folic acid, and related growth-promoting factors⁹. These observations should be kept in mind when prolonged therapy with these drugs becomes necessary.

Preliminary studies on the rumen contents of a permanent fistula animal indicated that this group of sulfonamides will reduce the rumen flora to some extent. The fact that synthesis of certain B vitamins definitely takes place in the ruminant animals should be considered in sulfonamide therapy.

Vitamins have been recommended as a preventive measure and treatment for calf scours and to some extent pneumonia. These are, namely: vitamins A and C, and certain members of the B complex. There is no question that these vitamins are essential for good growth and health of the calf. In a large dairy herd in which 128

calves 1 week to 10 days old. This procedure did not appear to check the acute type of scours, observed in 1- to 2-day-old calves, that is seldom, if ever, associated with a pneumonia. This is based on the fact that there were 66 cases of this type in the 128 calves born during the seven-month period.

DISCUSSION

We all know that the sulfonamides are not a panacea and cannot be used for all diseases; however, there is good evidence that they have a definite place in veterinary medicine. Much valuable information has been obtained on their relative toxicity and therapeutic efficiency. The dosages suggested in tables 5 and 6 are based on information obtained from the literature, practitioners, and our own experimental work. In most instances, the total daily dose should be divided into 3 equal doses.

As new chemotherapeutic agents become available, the matter of toxicity and therapeutic efficiency should be uppermost in the

minds of those concerned with experimental studies, clinical trials, and general use. For the most part, this has been the case in the past. After the war, sulfonamides should be readily available and perhaps more economical for veterinary use.

The use of the sulfonamides for wound

coccidiosis than either sulfasuxidine or sulfathalidine.

Toxicity studies on sulfathalidine showed favorable results, and, when used clinically on 75 cases of calf scours, it had a high therapeutic efficiency.

Sulfathalidine and sulfaguanidine have

Table 6—Showing Dosages Which Have Been Used for Sulfaguanidine, Sulfasuxidine, and Sulfathalidine

SULFONAMIDE	DISEASE	ANIMAL	AVE. NO. DAYS ADM.	DAILY ORAL DOSES	REMARKS
Sulfaguanidine	Scours	Calf	5-6	75-100 lb. calf 225 gr.	Reduce on third day to 150 gr. on succeeding days to 75 gr.
Sulfaguanidine	Enteritis	Swine	6-8	75 gr. for each 30-50 lbs. of body weight	No reduction
Sulfaguanidine	Enteritis	Sheep	4-6	75 gr. for each 100 lbs. of body wt.	No reduction
Sulfaguanidine	Enteritis	Dogs & Cats	6-8	7.7 gr. for each 20 lbs. of body wt.	No reduction
Sulfaguanidine	Coccidiosis	Poultry	7-14	0.5-1% of mash	Checks development of oöcysts
Sulfaguanidine	Coccidiosis	Calf	3 days a week for 6 weeks	150 gr. in 75 gr. doses for 3 days every other week	Checks development of oöcysts
Sulfaguanidine	Coccidiosis	Lamb	6-8 weeks	15-30 gr.	Checks development of oöcysts
Sulfasuxidine	Scours	Calf	5-6	3.5 gr./lb.	No reduction
Sulfasuxidine	Dysentery	Dog & Cat	2-4	15-30 gr. in 4 doses	No reduction
Sulfathalidine	Scours	Calf	3-4	0.7-2 gr./lb.	No reduction
Sulfathalidine	Enteritis	Swine	6-8	0.7 gr./lb.	No reduction
Sulfathalidine	Dysentery	Dog	6-8	1.0 gr./lb.	No reduction

infections and surgical procedures has been relatively successful and should be advocated.

SUMMARY

The results of toxicity studies on experimental calves given various dosages of sulfathiazole, sulfadiazine, sulfamerazine, sulfaguanidine, sulfasuxidine, and sulfathalidine are discussed briefly.

Clinical observations on 61 cases of acute calf pneumonia are given, 33 treated with sulfathiazole, 12 with sulfadiazine, and 16 with sulfamerazine.

Experimental studies and clinical observations indicate that sulfathiazole is less toxic and just as efficient as sulfadiazine for calf pneumonia.

Sulfamerazine shows promise of being a useful drug for the veterinary practitioner. Clinical observations on its use for calf pneumonia are most encouraging.

Further studies on sulfaguanidine have confirmed previous reports as to its efficiency for calf scours. It has proved useful in coccidiosis, both in poultry and livestock. Sulfaguanidine is more effective for

produced good results based on clinical studies when used for enteritis in swine, both with and without a vitamin supplement. These two drugs appear to be the most practical for use in enteric diseases.

Two dosage tables, based upon reports in the literature and extensive experimental investigations, are presented.

Studies on the various sulfonamides indicate that an increase should be made in the fluid intake of the body during their administration.

Each sulfonamide has its limitation and should be used judiciously for the purpose for which it is intended.

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(Continued on next page)

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Veterinary Medical Research

No one can tell off hand how much money is spent for research on animal diseases. The figures are not catalogued, but it's good guessing that they (the figures) would not be as alarming to the taxpayers as to the scientists in that field who stop to note that business men boast of spending 3 per cent of their gross income for research. Anyhow, that is the percentage given the other day by President Eric Johnson of the United States Chamber of Commerce (*Omaha Daily Journal Stockman*). Carried to hog raising, for example, which had a gross income last year of \$3,300,000,000, that would mean that \$99,000,000 should have been budgeted for hog research in 1944. While such a figure for research work on hogs would be fantastic, a little more of it parcelled out among the research men of the Middlewest would pay good dividends. In spite of remarkable advances made in swine pathology in recent years, much remains to be accomplished. When a swine breeder growls because there's no "shot" to knock necro and other pesky troubles out of the hoglot in one operation, the mind turns to the tiny sums he has spent in the discovery of "shots." Stockmen ought to ponder the amount of money "business" sets aside for research. One can't get something for nothing.

Livestock Losses

When we speak of livestock losses we are likely to forget the heavy casualties of young animals. In a report to the American Veterinary Medical Association at their recent convention, Dr. H. W. Jakeman made the following statement:

"Four colts have to be born to raise two work horses; one-third of all the pigs born die before maturity; 20 per cent of all dairy calves die before reaching productive age; one-fourth of the laying house pullets die prematurely."

Dr. Jakeman suggested that more statistics be kept in order to enable veterinary research workers to concentrate on those diseases causing the greatest losses. No question but more effort should be put forth by state and federal governments, as well as by livestock associations, to determine ways and means of lessening losses sustained through diseases of livestock and improper handling and feeding.—*Hoard's Dairyman*.

Let's reserve some sympathy for the remount and veterinary officers who will take charge of the hurriedly collected horses and mules that are being shipped to the Western Front—for immediate use. The hasty collection of horses and mules for military use is always associated with appalling morbidity and mortality that keep the animals out of harness for a long, long time. Besides, winter and spring in the Department of Vosges are unkind to outdoor animals.

Corrigendum

In the January JOURNAL a footnote identifying the article, "Studies on Porcine Enteritis. I. Sulfathalidine Therapy in Treatment of Natural Outbreaks," by Drs. Robert Graham, E. H. Peterson, C. C. Morrill, H. J. Hardenbrook, G. E. Whitmore, and P. D. Beamer, as a convention paper was erroneously omitted. This paper was read by title at the eighty-first annual meeting of the AVMA in Chicago, Aug. 22-24, 1944.

Differential Diagnosis of Respiratory Diseases of Fowl

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MUCH CAN be accomplished in the diagnosis of respiratory diseases in the field, providing sufficient reliable information is presented by the owner and a number of specimens can be observed or examined. The veterinarian working in the field has the advantage over the laboratory worker because he can obtain information which may require many days for the pathologist to gain through the methods available to him. On the other hand, the laboratory worker is in a position to obtain information which was of a confusing nature to the field workers. The two working together make a valuable combination which can simplify the task of both.

Each respiratory disease in its typical form has rather distinct characteristics with respect to its period of incubation, rapidity of spread, duration, mortality, and extent of lesions, and such information may serve to restrict the number of infections which will have to be considered.

The respiratory diseases considered in this paper are those which have been differentiated with respect to their etiology. Other diseases may exist in certain sections of the country in which the etiology is unknown. It is suggested that the veterinarian become familiar with the identity of those diseases common to his locality, as such information will contribute materially to the successful control of them.

We must admit that since the infections will often be atypical in nature, it becomes necessary to employ laboratory methods for their determination.

LARYNGOTRACHEITIS

Definition. — Laryngotracheitis is an acute, rapidly spreading, respiratory disease observed most frequently in semi-

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mature and adult chickens, but may involve young chicks on a farm while active in the older birds.

Etiology.—The causative agent is a filterable virus which is not very resistant to external conditions and quickly perishes.

Incubation Period.—Birds either die or recover from the disease within five to six days from the time of infection.

Mortality.—The mortality may vary from a few birds to a high percentage of the flock, depending upon the severity of the outbreak. In this respect, it is safest to consider that it is apt to be highly fatal.

Symptoms.—The symptoms are characterized by coughing, sneezing, and difficult breathing. In severe outbreaks, blood is observed in the exudates dislodged during coughing, and, if seen, is diagnostic of the disease. Occasionally, swellings of the face, and nasal exudation occurs with the disease, and thus may lead to confusion with infectious coryza and endemic fowl cholera infections.

Pathologic Findings.—These consist of the presence of blood and false membranes in the larynx and trachea, which, when removed, do not leave a raw ulcerative surface. The finding of blood and false membranes is diagnostic in semimature and older birds. It might only be confused with fowl-pox lesions of the larynx and trachea. It will be observed that fowl-pox lesions of the larynx and trachea may be wartlike in appearance and when removed, leave a raw ulcerative surface.

Mild laryngotracheitis may result only in the presence of mucus in the larynx and trachea. Since in that event it could be confused with other infections, we must rely upon laboratory facilities in making a differentiation.

In young chicks, the findings of caseous material and false membranes in the larynx and trachea would not be diagnostic, as such lesions could be common to both laryngotracheitis and infectious bronchitis. In this event, a good history will do much in making the distinction.

Principal Differential Features.—(1)

Rapid spread. (2) Short duration—infected birds die or recover within a period of a few days. (3) The presence of blood in the trachea is diagnostic. (4) The presence of false membranes in the larynx and trachea likewise is diagnostic in semimature and older birds, except for the possibility of fowl pox. (5) The occasional facial swellings and nasal exudate should be considered a complication rather than another disease entity, providing the other lesions are typical. In baby chicks, it becomes necessary to consider infectious bronchitis, but a good history will usually aid in making such a distinction. (6) Atypical laryngotracheitis infection will require laboratory facilities for making a distinction. If susceptible birds are available, it is sometimes possible to make the differentiation by inoculating the walls of the cloaca, using some of the exudate and noting the reaction after four to five days. If the cloaca is reddened, swollen, or shows false membranes, it would be indicative of laryngotracheitis, as the other infections fail to incite such reactions.

INFECTIOUS CORYZA

Definition.—Infectious coryza may be either an acute or chronic, rapid or slow spreading infection of all ages of chickens, pheasants, and quail. The disease is most often confined to the upper respiratory tract, but the trachea and lungs may show an extension of the infection.

Etiology.—The organism *Hemophilus gallinarum* is responsible for this disease. The organism requires blood, or substances containing the growth factors of blood, for its propagation.

Duration of Infection.—In virulent outbreaks, the duration of the infection may be short, ten to fourteen days. In less virulent outbreaks, weeks or months may be required before recovery is noted.

Incubation Period.—Laboratory birds inoculated intranasally show infection within twenty-four hours and this is of extreme importance in differentiation as it is the shortest incubation period of any of the respiratory diseases so far as those affecting the nasal passages are concerned.

Mortality.—The mortality is not significant except in virulent outbreaks and in young chicks.

Economic Effects.—Laying birds usually show a prolonged period of unprofitable

production. Young, growing birds show a retarded growth.

Symptoms.—The symptoms are characterized by nasal discharges of a serous, catarrhal, or purulent nature. Swellings about the face, wattles, and the skin of the throat may also be observed. The facial swellings are of an edematous type, involving the skin and tissue rather than resulting from accumulations and bulging of the nasal chambers. These swellings are such that the eyes may be closed through the effects of it. Coughing and difficult breathing may also occur.

Pathologic Findings.—In the upper respiratory disease outbreaks, the lesions are confined to the nasal passages, face, wattles, and the skin of the throat. The nasal passages show varying amounts of exudates of a serous, catarrhal, or purulent nature. The swellings of the face, wattles, and throat are first of an edematous type, which after a few days become of a cheesy fibrinous nature. When the trachea and bronchi are involved, the exudate is of a mucocatarrhal type. In those cases in which death results, whitish foci may be observed on the liver and also petechial hemorrhages of the heart.

Whitish false membranes may be observed in the mouth, but these lesions are also noted in other conditions.

Caseous accumulations in the air sacs have also been observed with this infection but this is exceptional rather than a common finding.

Principal Differential Features.—(1) Rapid or slow spread. (2) Short incubation period. Susceptible birds, inoculated intranasally with the exudate or cultures of this infection, show symptoms within twenty-four hours. None of the other respiratory diseases result in nasal infections in such a short time. (3) This is the only respiratory disease which responds to medication with sulfathiazole and hence this material could be used to aid in diagnosis. (4) The swellings in this infection are of an edematous nature and bacteriologically sterile unless a blood medium which supports growth of *H. gallinarum* is employed. (5) This infection is not contagious so that if careful sanitary precautions are employed the infection does not spread between separately housed groups of birds. Laryngotracheitis and infectious bronchi-

tis spread rapidly under similar circumstances.

INFECTIOUS BRONCHITIS

Definition.—Infectious bronchitis is a very acute, rapidly spreading respiratory disease of chickens of all ages.

Etiology.—A filterable virus which is not very resistant to external conditions and quickly perishes.

Incubation Period.—Inoculated birds may show symptoms within eighteen to forty-eight hours.

Rapidity of Spread and Duration.—Entire pens of birds may develop the disease and recover (except for individuals) within ten to fourteen days from the onset of the trouble.

Mortality.—The mortality in semimature and older birds is negligible. A mortality in laying birds may occur as a result of the sudden disruption of egg production or through derangement of the reproductive organs.

The mortality in baby chicks is quite variable, 5 to 70 per cent.

Economic Effects.—High mortality in baby chicks, disrupted egg production in laying hens, and slightly retarded growth in young birds.

Symptoms.—Respiratory rales, coughing and sneezing, which is most pronounced at night or in the early morning are characteristic. A serous nasal discharge is noted in about 30 to 50 per cent of the affected birds, but this symptom does not appear until six days after the bird has shown the first symptoms.

Pathologic Findings.—The principal lesions in young and old birds consist of accumulations of mucus in the trachea and bronchi. Other lesions may consist of serous exudate in the nasal passages and clouding of the walls of the air sacs. Accumulations of cheesy material in the air sacs also are observed sometimes.

In young chicks, caseous plugs are sometimes observed in the trachea in addition to the previously mentioned findings. Young chicks may also show swellings of the face from accumulations of caseous material in the nasal passages, and there may be accumulations of caseous material around the eyes.

Principal Differential Features.—(1) Extreme rapidity of spread and typical symptoms. (2) Absence of swellings ex-

cept in baby chicks. (3) Short duration. First pens of affected birds will have recovered within ten to fourteen days. (4) No mortality in semimature or adult birds. (5) Infective material inoculated in mucosa of the cloaca fails to show any significant changes after four to five days.

FOWL POX

It may seem rather strange to include this disease with the respiratory infections, but not infrequently specimens are presented which fail to show any external lesions but have involvements of the nasal passages, eye, or the larynx and trachea. The disease under these circumstances may simulate infectious coryza, laryngotracheitis, or endemic fowl cholera.

Principal Differential Features.—(1) If lesions are in the larynx or trachea it is characterized by false membranes or wartlike growths, which, when removed, leave a raw, ulcerative surface. (2) Eye and nose infections are characterized by caseous material which is not observed with *H. gallinarum* infection. (3) Observation of a number of the birds will usually show some with external lesions. (4) The diagnosis may definitely be established by scarring the comb of a susceptible bird and rubbing it with the suspected exudate. After seven to ten days, typical pox lesions will be observed in case it was present.

AVIAN PNEUMOENCEPHALITIS¹

This disease has only recently been described and is characterized by symptoms and lesions similar to infectious bronchitis, except that nervous symptoms are also a common involvement. It is caused by a filterable virus.

Principal Differential Feature.—Combination of nervous and respiratory symptoms.

CHRONIC CORYZA, BRONCHITIS²

This disease, only recently identified, is characterized by slow spread and long duration. It is caused by a virus which produces symptoms of both chronic coryza and bronchitis in old birds and a simple chronic coryza in young chicks and birds.

Principal Differential Features.—(1) Long incubation period, six to seventeen days. (2) Long duration—weeks or months. (3) Low mortality. (4) Serious effect on egg production. (5) Little effect in young chicks.

ENDEMIC FOWL CHOLERA

Etiology. — *Pasteurella avicida*. — Limited studies at the Texas Agricultural Experiment Station indicate the organism may show the characteristic reactions in sugars but produces gas in blood and meat mash mediums.

Incubation Period. — Not accurately known, but appears to be long in most field situations. Experimentally, the disease may be observed within twenty-four to forty-eight hours following intranasal inoculation.

Duration. — Usually prolonged—weeks or months.

Rapidity of Spread. — Slow in most outbreaks, although in some instances it may be relatively fast.

Mortality. — May be high.

Symptoms and Postmortem Findings. — The symptoms are most often characterized by nasal exudation, facial swellings as the result of distended nasal cavities, and swollen wattles. In typical field outbreaks perhaps not more than 15 per cent of the birds develop distended sinuses or "roup" as referred to by poultrymen.

In some instances, the lower respiratory tract may be involved, giving rise to symptoms characterized by coughing, sneezing, and respiratory rales. Affected flocks may also be characterized by a typically offensive odor.

Principal Differential Feature. — Requires laboratory facilities, isolation, and identification of the causative organism, *P. avicida*.

COCCOBACILLIFORM CORYZA^{3, 4}

This disease is characterized by a coryza having a long incubation period and a protracted course. It is caused by coccobacilliform organisms.

The differentiation of this infection would have to be based on bacteriologic findings. It is not known whether sulfathiazole affects the course of this disease. If it does not, this drug would assist in eliminating *H. gallinarum* from consideration.

Other infections such as pullorum and aspergillosis may give rise to symptoms of respiratory distress, but these may be determined by postmortem examination in which the typical nodules affecting the lungs will be noted. Such infections are usually seen in young chicks. They may occur alone or may complicate the respiratory infections.

Foreign bodies and parasites may also

give rise to symptoms of respiratory distress, but a postmortem examination will suffice to establish such entities.

INFECTIOUS SINUSITIS OF TURKEYS

Definition. — Infectious sinusitis may be either a slow or rapidly spreading disease of turkeys of different ages resulting in involvement of the sinuses or lower respiratory tract, *i. e.*, lungs and air sacs.

Etiology. — Not definitely established. Recent studies at the Texas Agricultural Experiment Station⁵ indicate that in some outbreaks a gas producing pasteurella-like organism is involved. Sufficient studies have not been completed to indicate whether this is the prevailing causative organism in all disease outbreaks.

Incubation Period. — Experimentally forty-eight to seventy-two hours by intranasal swabbing of infective material.

Symptoms. — Nasal exudate, foamy secretions from the eyes, swellings of the sinuses and partial or complete closure of the eye. Respiratory rales may be observed in some birds failing to show any upper respiratory involvement.

Pathologic Findings. — Sinuses usually contain a watery or semigelatinous exudate or in some long standing cases a caseous exudate may fill the sinuses. Pneumonia is a frequent manifestation of the disease. Occasionally caseous material may be observed in the air sacs.

Mortality. — The mortality may be negligible or reach fairly serious proportions.

Economic Effects. — Retarded growth of young birds, loss of egg production in breeding flocks.

Duration. — Individual birds may recover without treatment within two weeks, some individual birds may continue to show the involvement for weeks or months.

Preventions. — Segregation of old and young birds so that recovered birds which are possible "carriers" do not contact young susceptible turkeys should constitute the basis of the control program.

Treatment. — Aspiration of the exudate from the sinuses by means of a hypodermic syringe and injecting a solution consisting of 2 to 4 per cent silver nitrate into the affected sinuses, constitutes a satisfactory form of treatment. Limited studies indicate sulfathiazole used at the rate of 0.75 to 1.0 Gm. sulfathiazole for adult birds morning and night gives promise of being of value in those instances in which the sinuses do not contain caseous exudate. Improvement and recovery usually occur within six days. In those cases of lower

respiratory involvement, its use would seem to warrant trial as it would constitute the only logical treatment of value in such situations.

Differential Considerations.—The disease may be confused with vitamin A deficiency because of the frequency of sinus involvement in this latter disease, but post-mortem examination should be sufficient to distinguish between them.

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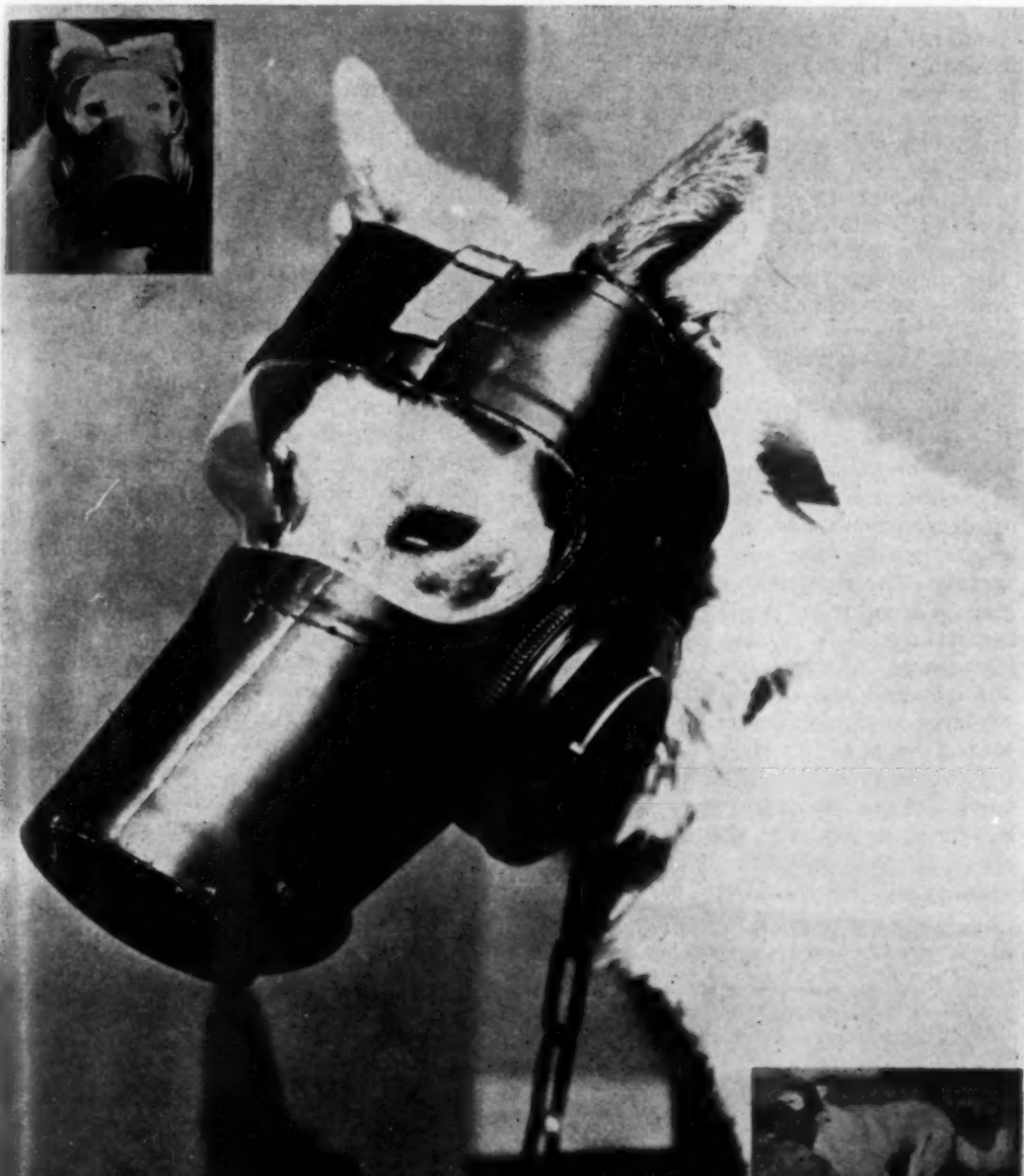
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Gas Mask for War Dogs

The Chemical Gas Warfare Service, U. S. Army, has developed the gas mask for dogs and has demonstrated its feasibility as a protection of dogs against exposure to war gases. The dog, Lassie, was assigned by the QMC to the Chemical Gas Warfare Service for research. On account of the extraordinary respiratory capacity of dogs and horses, gas masks were found to be impracticable during World War I.



Specific Diagnosis and Chemotherapy of Avian Coccidiosis

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Veterinarians hesitate to make diagnoses of poultry diseases for numerous reasons. Lack of knowledge and equipment are the usual excuses offered among others. Yet it is my contention that 80 per cent or better of the cases of diseases in poultry can be diagnosed with only a certain amount of basic information, intelligent, keen observation, and no more equipment than a pocket knife.

Coccidiosis is the most important and devastating parasitic disease of chickens in our area. When control methods include chemotherapy, it is of prime importance to determine which of the eight species, singly or in combination, is doing the damage. Four species of coccidia are the most consistent trouble-makers and, fortunately, these produce such typical gross lesions that a specific diagnosis can be made by a naked-eye examination of the intestine.

Eimeria acervulina.—This species of coccidia manifests itself by the production of white streaks running more or less transversely across the intestinal mucosa. Usually these streaks are much more numerous in the duodenum but in severe cases they may extend well down beyond the middle of the small intestine. These white patches or streaks consist of large sheets of oöcysts or schizonts all in the same stage of development. As a rule, these gross lesions can be seen only from the mucosal surface. The intestine is thickened. There may be a catarrhal exudate but little or no hemorrhage. If a portion of the mucosa in the area of the streak is smeared on a slide, and mounted and examined fresh, one will see large agglomerations of oöcysts or schizonts fairly small in size.

Eimeria brunetti.—Mild cases with this species have no marked gross lesions. Severe cases, however, will be affected with a dry, necrotic enteritis. The affected area usually will be the lower portion of the

small intestine, the rectum, and also the narrow, tubular portion of the cecum. This dry necrosis may completely affect the entire intestinal mucosa. In other instances, this necrosis may be just patchy. Some cases have been observed where actual perforation of the intestine occurred with resulting peritonitis. Birds acutely affected with *E. brunetti* will harbor large numbers of large-sized oöcysts which appear rather similar to *Eimeria maxima*. Often the disease is rather chronic and in those cases only a few oöcysts may be found. The usual lesion observed in the tubular portion of the cecum is a short, caseous plug. Birds of any age may be affected with this species of organism.

Eimeria necatrix.—This species is common and markedly pathogenic. Birds of all ages are involved but usually severe outbreaks do not occur in birds younger than 2 1/2 or 3 months. Severe cases exhibit a marked dilatation of the middle third of the small intestine. The intestinal wall becomes very thick but quite flaccid and often badly necrotic. From the serosal surface can be seen numerous, round, white spots. Interspersed among these are many hemorrhagic spots about the size of a pinhead. The intestinal wall takes on a dark, purplish, reddish hue. This is caused by the tremendous accumulation of clotted blood in the intestinal lumen. When the intestine is cut, the contents will be found to be composed of clotted blood, fibrin, necrosed epithelium, and a blood-stained serum-like fluid. The mucosa is greatly thickened and necrotic. If smears are taken from the mucosa no oöcysts will be found, but very large schizonts will be seen arranged in grapelike clusters. These schizonts are thin-walled and of such great size as to eliminate the possibility of confusing them with oöcysts. It is these grapelike clusters of schizonts which produce the round, white spots that can be seen from the serosa. The white spots cannot be seen from the mucosal surface because the colonies of schizonts are situated deep in the intestinal wall.

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In this disease, the cecum remains unaffected. Although the oöcysts of this species are produced in the cecum, no gross lesions in the cecal wall occur. It is true that blood may be found in the ceca of birds affected with *E. necatrix*. This blood, however, does not come from the cecal wall but is aspirated from the intestine.

Eimeria tenella.—This species usually affects birds from the first week up to the third month. It produces the so-called bloody, cecal coccidiosis and is confined entirely to the cecum. The birds discharge bright red, bloody droppings and on post-mortem examinations, the ceca are found to be distended with fluid blood. In cases of longer standing, there may be a bloody, caseous core in the ceca. The cecal wall is also markedly thickened and in severe cases, is almost white in appearance due to the tremendous number of oöcysts which are produced there.

Eimeria maxima.—This species produces a severe catarrhal enteritis which usually affects the lower half of the small intestine. Sometimes the inflammatory exudate that is produced is somewhat blood-tinged. Infection with this species cannot be recognized with accuracy by naked-eye examination and, usually, smears must be taken and the characteristic, large-size oöcysts must be found.

Infection with *Eimeria praecox*, *Eimeria mitis*, and *Eimeria hagani* does not produce any characteristic lesions by which they can be recognized. These species, however, are relatively nonpathogenic.

Recent studies have shown that certain drugs are of value in the control of avian coccidiosis. Of these drugs, two have definite coccidiostatic powers. These are sulfur and sulfaguanidine.

Let us consider sulfur first. Sulfur is effective against only two of the eight species that affect chickens. These are *E. tenella*, the cause of acute coccidiosis, and *E. necatrix*, the cause of severe intestinal coccidiosis. When sulfur is fed to birds in the proportion of 5.0 per cent of the ration, infection with these two species is prevented to a remarkable extent. This effect is strictly preventive rather than curative. Birds that have already become infected with the organism will not be helped by the sulfur feeding. Unfortunately, none of the other six species are controlled by sulfur. Furthermore, continued feeding of sulfur

in the absence of direct sunlight may induce a condition known as sulfur rickets in chickens. Consequently, the feeding of sulfur is advocated for limited periods of time. In our area, we recommend that sulfur should not be fed for longer than two weeks. During the time that sulfur is fed, all efforts should be made to remove the source of infection. This should be done either by cleaning up the house, removing all litter and manure, or cleaning the house periodically. If the birds are on range, it becomes necessary to remove the birds from the contaminated range to a portion of the range which is uncontaminated and has not yet been used.

Sulfaguanidine has the advantage over sulfur in that, in proper concentration, all of the species that attack chickens may be controlled with it. Again it should be emphasized that sulfaguanidine will not cure birds already infected with the disease. It will prevent infection, however, even though the birds are running on heavily contaminated premises. Experimental results indicate that effective prevention of infection due to *E. necatrix* is obtained when sulfaguanidine is fed in the proportion of 1.5 per cent of the ration. *E. tenella* may be effectively controlled by the feeding of sulfaguanidine to the extent of 1.0 per cent of the ration. The other six species have been found to be effectively controlled by feeding of sulfaguanidine to the extent of one-half of 1.0 per cent of the ration. As a matter of fact, recent preliminary experiments indicate that as little as two tenths of 1.0 per cent of sulfaguanidine in the ration will effectively control the other six species of coccidia. At the present time, sulfaguanidine is not readily available and is much too high in price to permit its general use. However, there is every indication that with cessation of hostilities, sulfaguanidine will be much more readily available and much cheaper in price.

The feeding of sulfaguanidine up to 0.5 per cent of the ration is unaccompanied by any toxicity that can be measured, at least for a short period of time. When 1.0 per cent or 1.5 per cent sulfaguanidine is fed, then it has been noted that the birds do not gain weight at the normal rate, and at the end of two weeks may cease gaining weight and even lose weight. Consequently, we have advocated that if sulfaguanidine is used, it should not be fed for more than a

two-week period of time. Again, during that interval, it is necessary to clean up the premises thoroughly or else remove the birds to some uncontaminated area.

It should be fully understood that the control of coccidiosis cannot be accomplished solely by means of chemotherapeutic agents. They should be used merely as adjuncts to proper sanitary measures. Their greatest usefulness lies in giving the poultrymen time in which to effect a clean up. When sulfur or sulfaguanidine are fed, it is assured that the outbreak will not become any worse than it is even though the birds may still be in heavily contami-

nated quarters. The poultryman may then do an effective cleanup job at his leisure. These drugs could also be used in instances where only one or two pens out of many are affected with coccidiosis. Unaffected pens could be medicated and thus protected until the focus of infection has been cleaned up. Thus far, no drug is known which can be safely made a permanent part of the ration of chickens. Perhaps that is a good thing. When human beings or animals must be medicated continually in order to be kept healthy or alive, that is evidence of a fundamentally unsound situation. Medication can never take the place of proper poultry husbandry.

The Surgeon General and His Staff



In the portrait, left to right, are—Brig. Gen. Charles C. Hillman, M. C., Brig. Gen. Hugh J. Morgan, M. C., Brig. Gen. Raymond W. Bliss, M. C., Col. James R. Hudnall, M. C., Brig. Gen. Fred W. Rankin, M. C., Lt. Col. Robert J. Carpenter, M. C., Col. Edward Reynolds, M. A. C., Brig. Gen. Raymond A. Kelsner, V. C., Maj. Gen. Norman T. Kirk, M. C., the Surgeon General, Maj. Gen. Robert H. Mills, D. C., Maj. Gen. George F. Lull, M. C., Brig. Gen. James S. Simmons, M. C.

The portrait of the Surgeon General and his staff by Francis Criss is one of a series of approximately 250 paintings, drawings, and water colors describing and recording the activities of the Medical Department throughout the world during the present conflict. It is the only portrait in the series and, therefore, has great interest. Some 15 of the country's finest artists have been engaged for two years in recording Medical Department activities, and their subjects range from the production of medical supplies to the Battalion Aid Station. These artists have been on the Normandy Beachhead, at Saipan, and in Chungking. It is expected that the entire series will first be released to the public about the first of February 1945. All material will remain the permanent property of the Army Medical Department.

Panel Discussion on Poultry Diseases

Following is the transcript, slightly revised in the interest of brevity, of the panel discussion on poultry diseases presented at the Chicago Session of the Association in August, 1944. Dr. Cliff D. Carpenter, executive manager, Institute of American Poultry Industries, Chicago, Ill., presided as chairman.—Editors.

DR. CARPENTER—Ladies and Gentlemen: So that you may know each of the panel members, I will introduce them and the phases of the discussion they are to present. First are the two gentlemen who have just presented papers, Dr. J. P. Delaplane, poultry pathologist, Texas Agricultural Experiment Station, on respiratory diseases, and Dr. P. P. Levine, associate professor, Department of Pathology and Bacteriology, New York State Veterinary College, on parasites and parasite control. The others are Dr. J. Holmes Martin, head, Department of Poultry Husbandry, Purdue University, on genetics and management as related to disease control; Dr. R. E. Lubbehusen, pathologist, Ralston Purina Co., on nutrition and nutritional diseases; Dr. B. S. Pomeroy, associate in animal pathology, University of Minnesota, on turkey diseases; Dr. Frank Tucker, practitioner, Claypool, Ind., and Dr. Paul V. Neuzil, practitioner, Blainstown, Iowa. Drs. Tucker and Neuzil will cover the various aspects of poultry practice.

We will develop the subject matter, in which each is a specialist, by interrogating the panel members. The answers may then be debated by the panel, after which we will have questions from the floor.

RESPIRATORY DISEASES

First, the subject of respiratory diseases. Dr. Delaplane, admitting the difficulties of diagnosing respiratory diseases and the difficulties encountered by the farmer and the practitioner with respect to the control of respiratory diseases, will you briefly outline the general recommendations that you would make to the farmer with respect to coryza or infectious colds, chick bronchitis, technically known as infectious bronchitis, and laryngotracheitis?

DR. J. P. DELAPLANE—In answering, I should like to make this statement first: In all of these respiratory diseases, there is only one vaccine which is of any value

in immunizing birds against any of them. In other words, laryngotracheitis vaccine is the only one that is effective, and it is only effective against that disease.

Fortunately, with this whole group of diseases, once the birds have recovered from them, they can then be classified, probably, as carrier birds. I do not say that there are proved carriers for all of these infections, but there are carriers for most of them. When these birds have recovered and have gone over into the carrier stage, which probably represents a small percentage of the birds in a flock, it will then require contact between those old, recovered birds and the new or young replacement stock for a new outbreak to be incited the following year. If we keep that point in mind, we can develop a program whereby we may eliminate these infections from a farm or prevent their occurrence in succeeding years. I would like to outline such a program.

The first prerequisite is this: If you are in a position to advise the purchaser of chicks, by all means insist that he purchase them from a hatcheryman who does not make a practice of keeping battery chicks in the incubator room, because that is the chief source for the introduction on a farm of infectious bronchitis.

Secondly, brood the chicks in brooders and on clean range, entirely out of contact with old birds. When I say "entirely out of contact with old birds," I mean that a single fence between the old and young birds does not constitute a break in direct contact. Unfortunately, many poultrymen think that it does. Any method which will insure against direct contact between the old and young stock is desirable and may be accomplished in several ways: by rearing the young stock at distant points on the farm; by keeping the old flock confined to the houses at all times to prevent their coming in contact with the young stock; and by having double poultry brood fences

at least 4 or 5 feet apart between the old and young flocks.

When the new flock reaches maturity, it is wise to dispose of the old birds. If this is done approximately a week before the new flock is ready to be housed and the buildings are cleaned, it will then be safe to house the new pullets, as they will not have a chance to come in contact with carriers.

There is one recommendation to insist upon in this program: Make sure that the farmer does not have a pet chick that he wants to keep, because the pet may undo all of your efforts, and all too commonly we see pet chickens on farms.

If old birds have to be kept because of their value as breeders, such as R.O.P., make sure they are housed in buildings separate from the pullets and that they never come in contact with the pullets, even when running outdoors. Unless the birds are of unusual breeding value, they should not be held over. I think that, in most instances, there is very little excuse to keep the old birds.

Do not make a practice of introducing breeding stock in any manner except through hatching eggs or baby chicks. The baby chicks will be clean if the hatcheryman does not keep a battery brooder in the incubator room. Of course, I am speaking primarily of chick bronchitis.

If adult birds have to be purchased for breeding purposes, it is wise to advise placing them in quarantine, along with a number of the less desirable pullets on the farm, a half mile or more from the main operation. They should be kept together for a month or more in order to determine whether the roosters are carriers of any of these infections. If, after that period of time, the birds remain healthy, it would be reasonably safe to add them to the flock. If, on the other hand, they show infection, it would be wise to dispose of the entire test group. Many, many times, people buy their respiratory troubles, and one good way of buying them is with breeding stock.

A fifth thing is, do not return birds to the flock from poultry shows as they may be carrying infections of all kinds. Do not permit poultry buyers on the farm with their trucks, because they may have a partially diseased load of birds. Provide your

own catching crate. Discourage visitors from entering the pens.

This program I have outlined will handle, perhaps, all of the respiratory diseases except infectious bronchitis in built-up or city areas. In such circumstances, this program will not always work. It will work if the farms are widely separated but, unfortunately, it will not work in closely built-up poultry sections.

CHAIRMAN CARPENTER—Dr. Delaplane, you said that birds should not be returned to the flock from poultry shows. How about egg-laying contests?

DR. DELAPLANE—I consider that egg-laying contests are shows.

CHAIRMAN CARPENTER—In New England, considerable work has been done in exposing growing pullets to infectious bronchitis, chick bronchitis, before they reach the laying age. Do you recommend that as a practice?

DR. DELAPLANE—I am probably responsible for that practice in New England. It has a place in New England, but not anywhere else in the United States.

CHAIRMAN CARPENTER—Why?

DR. DELAPLANE—Because of the close proximity of poultry farms. As explained in the latter part of my paper, other control measures for infectious bronchitis will fail where farms are close together. I certainly would not recommend exposing growing pullets in the Middlewest or other areas where there is some distance between poultry farms.

CHAIRMAN CARPENTER—Dr. Tucker, in your experience and practice, can you subscribe to the recommendations made by Dr. Delaplane?

DR. FRANK TUCKER—I think the principles he has outlined are sound.

CHAIRMAN CARPENTER—Do you employ them in your practice?

DR. TUCKER—Yes, I do.

CHAIRMAN CARPENTER—Dr. Neuzil, can you subscribe to those principles?

DR. PAUL V. NEUZIL—I think they are all right, with one addition. In the Middle-west, quite frequently hatcherymen have a practice of prescribing for and treating sick poultry. During the hatching season, many farmers bring dead birds and infected birds into the hatchery. Consequently, the infectious agent of infectious bronchitis may become established in the hatchery-room and do a lot of damage.

Practitioners who know these hatcheries are on the look-out for that problem.

CHAIRMAN CARPENTER—Dr. Delaplane, do you have any bulletin or outline which would be useful to practitioners, covering the points made in your talk?

DR. DELAPLANE—The material which I presented this afternoon is given in some detail in Bulletin 288 and may be obtained by writing to the Rhode Island Agricultural Experiment Station, Kingston, R. I.

AVIAN COCCIDIOSIS

CHAIRMAN CARPENTER—Dr. Levine, in discussing your paper, the first three questions that I have here were adequately presented in your discussion. Rather than repeat the questions I would like, at this time, to ask for questions from the floor or from members of the panel on the subjects you have covered.

DR. DELAPLANE—In your recommendation for the use of sulfur, do you find it advisable or do you make a practice of using this material constantly in the mash, as many poultrymen think they should do?

DR. P. P. LEVINE—We advocate the use of sulfur as an adjunct to adequate control measures. As such, we consider that the sulfur feeding should be used only for a short time, over the critical period. In view of the fact that sulfur, in the concentration of 5 per cent of the ration, will eventually produce sulfur rickets in chickens, in the absence of sunlight, we do not recommend feeding it in this concentration for longer than two weeks. It is assumed, however, that before that two-week interval is over, adequate measures will have been taken by the poultryman to remove the focus of infection.

CHAIRMAN CARPENTER—In summarizing, would you say, then, that drugs alone can be depended upon to control, prevent, or cure coccidiosis?

DR. LEVINE—No, definitely not.

CHAIRMAN CARPENTER—Can management alone be depended upon to prevent, cure, or control coccidiosis?

DR. LEVINE—Yes. Again, as mentioned in my paper, if I were given the choice of medication alone or management alone, I would take management. It seems to me that, if domestic animals, including poultry, have to be medicated continually in order to keep them healthy or alive, there is something fundamentally wrong. We know, for instance, that you cannot control, you

cannot get at the fundamental control of, malaria in human beings by saturating the body with quinine. It is just a stopgap. The only way to get rid of malaria is to get rid of the vector, the malaria-carrying mosquito. The same thing applies to coccidiosis. One may medicate for a short time and overcome one crisis. As soon as the medication is withdrawn, the birds once more become wide open to infection. In many areas, repeated infections have occurred where medication alone has been used and no other control practices were employed.

DR. LYMAN PECK (Ft. Wayne, Ind.)—I would like to ask Dr. Levine whether he recommends additional vitamin D for birds while they are being fed sulfur.

DR. LEVINE—Under ordinary circumstances, we do not feel that a two-week feeding period of sulfur will materially affect the bone development of birds. In view of that fact, we do not use additional vitamin D in the ration. If, however, sulfur has to be fed for longer periods, recent work at the Texas Experiment Station indicates that stepping up the vitamin D content of the ration to four times the usual amount will adequately control the rickets condition. Furthermore, it has also been found that if birds are exposed to sunlight they may be fed sulfur for longer periods without any danger of rickets appearing.

CHAIRMAN CARPENTER—Provided the sunlight is not so powerful that the birds stay in the shade all the time just because the sun is shining. That wouldn't be practical, would it?

DR. LEVINE—No.

DR. MARVIN S. THORPE (Canby, Minn.)—Can you build up an immunity to coccidiosis by exposing chicks to the infection?

DR. LEVINE—That is a good question. My answer to that is this: You can develop an immunity to every species of coccidia. Unfortunately, the degree of immunity and the speed with which immunity develops is not the same for all species. For instance, *Eimeria maxima*, *Eimeria brunetti* and *Eimeria praecox* develop a rapid immunity in the chick. One small dose, without producing clinical symptoms, will make the bird practically immune, solidly immune.

In the cases of *Eimeria tenella* and *Eimeria necatrix*, the two "bad boys" of the outfit, you can infect birds repeatedly with these species and still they will come

down with the disease on subsequent exposure.

Under ordinary conditions, when poultrymen claim that they never have any trouble with coccidiosis, that may be true from the clinical standpoint. Actually, I am firmly convinced that what happens is that their systems of management and of handling the birds and raising them is such that the birds are exposed to minimal, nonlethal, sublethal, or subclinical doses of coccidia over a fairly long period, during which time an adequate immunity is built up.

DR. R. FENSTERMACHER (St. Paul, Minn.)—I would like to ask Dr. Levine whether he has had experience with urea in the handling of coccidiosis.

DR. LEVINE—I have not had experience with urea. There are some products available, I understand, which are combinations of sulfur and urea for combating coccidiosis.

CHAIRMAN CARPENTER—How about sulfur and charcoal?

DR. LEVINE—It is claimed that charcoal adds to the efficiency of sulfur. The Texas and the Louisiana workers, I believe, are the ones who have emphasized that point. We have not thought it important enough to include in our consideration of handling the disease.

ROUNDWORMS AND TAPEWORMS

CHAIRMAN CARPENTER—We will pass on to some macroscopic parasites. Dr. Levine, what is new in the control of roundworms, the common roundworm, and tapeworms?

DR. LEVINE—We have effective agents which will remove the common roundworm from chickens. Most of you are familiar with them: compounds employing nicotine, tobacco by-products, and things along that line. I don't believe that roundworm removal should present any difficulty to the veterinarian.

With regard to tapeworms, the situation is much as it has been ever since the first tapeworm was found in a chicken. There has not yet been developed a single, good, safe tenicide for chickens, all the advertising to the contrary notwithstanding.

CHAIRMAN CARPENTER—Would you repeat that last, please?

DR. LEVINE—I say there has not been developed a single, good, safe tenicide for chickens (period)!

CHAIRMAN CARPENTER—Do you have any

comment on the recent work on compounds of tin? In your estimation, do they hold promise for the practitioner?

DR. LEVINE—They hold some promise but there is much developmental work yet to be done.

CHAIRMAN CARPENTER—Any questions on roundworm and tapeworm control from the floor, or by members of the panel?

DR. TUCKER—If birds are brooded on clean range, separate and away from other birds, worm infestation will not be great, in my opinion.

CHAIRMAN CARPENTER—Let's have a discussion on what you consider clean range. Technically, practically, what is clean range? How do you describe to your client what you mean when you say, "Brood these birds on clean range"?

DR. TUCKER—If I were defining a clean range, I would say one where there has been no chicken or chicken manure for at least two or three years.

CHAIRMAN CARPENTER—And you would include turkeys?

DR. TUCKER—If I were in the turkey business, I would want a farm where no chickens had been kept.

CHAIRMAN CARPENTER—Dr. Neuzil, have you anything to add to that?

DR. NEUZIL—Practitioners who do autopsy work on chickens frequently find intestinal parasites in conjunction with some other condition. We know then that we have a problem on our hands, right from the start. That is where a practitioner has to be more or less of a diplomat in order to accomplish results, along with being a good practitioner.

FEEDING METHODS TO CONTROL COCCIDIOSIS

CHAIRMAN CARPENTER—A question occurs to me, Dr. Lubbehusen, that you might answer. In view of some recent findings by the University of Wisconsin, do you have any comment about keeping the birds well fed, let's say a full ration, versus the so-called starvation method or intermittent feeding, as a means of controlling coccidiosis?

DR. R. E. LUBBEHUSEN—We haven't done any research work on that either to confirm or deny the findings.

CHAIRMAN CARPENTER—Do you recommend starvation or intermittent feeding?

DR. LUBBEHUSEN—We never recommend starvation in birds. We like to keep them on normal, full feed.

CHAIRMAN CARPENTER—I think the point that might be added is this: Herrick of Wisconsin has recently reported that, where birds do not have access to feed the first thing in the morning, they will browse around, let's say, mechanically or otherwise; if the birds have feed, they are going to eat feed. They are hungry the first thing in the morning and, if they don't have any feed, they will browse. I think that is the practical aspect of Dr. Herrick's findings.

DR. CHARLES W. DARBY (East Lansing, Mich.)—I would like to throw a bombshell up there in the panel and ask them about "milk flushes."

CHAIRMAN CARPENTER — We couldn't leave coccidiosis without having something about "milk flushes." I think Dr. Lubbehusen is the man to answer that question on milk feeding with respect to recovery from coccidiosis, or prevention.

DR. LUBBEHUSEN—I can answer that very shortly by stating that I am unalterably opposed to the feeding of milk, at least the way milk is usually fed. Under average conditions, there is a tendency of poultrymen to feed milk to the point of creating a too-laxative condition in birds and thereby, perhaps, defeating the very purpose of the milk feeding. If my opinion is worth anything, I am opposed to the feeding of milk.

CHAIRMAN CARPENTER—Would you put any limitations on that, when you say "the usual way in which it is fed"?

DR. LUBBEHUSEN—Yes, I think I made that clear.

CHAIRMAN CARPENTER—Do you recognize milk as an appetizing factor, where a flock is sick, that might cause the birds to have an increased desire to feed?

DR. LUBBEHUSEN—Now you are getting over onto another angle of the question. It is certainly desirable to keep birds on feed, as one of the ways of keeping up their resistance. If milk feeding is employed as a means of keeping up the nutrition of birds, then, certainly, I encourage its use for that particular purpose.

MANAGEMENT PRACTICES

CHAIRMAN CARPENTER—Now, Dr. Martin, to get into some practical management problems that are profitable to the farmer. First, what about dropping pits versus the old style dropping board?

DR. J. HOLMES MARTIN—I think the war

has brought several practices with poultry to the forefront that have rather quickly proved of value, and I certainly consider dropping pits one of them. I used to think the dropping boards should be scraped twice a week in winter and twice a day in summer. Now we find many successful poultrymen who use dropping pits and do not empty them more than once every six months. A few have let them go for an entire year and have had little mortality.

CHAIRMAN CARPENTER—Do you recommend screening?

DR. MARTIN—Yes, wire screening immediately under the roosts so the birds cannot get into the dropping pit; then in the spring, add some fertilizer like 0-10-10 or 0-12-12, or rock phosphate; borax has also been used, anything to discourage the parasites, particularly insects, from breeding within the droppings themselves. Such materials also cut down the odor and make the droppings from the pits more valuable as fertilizer.

CHAIRMAN CARPENTER—Now we come to a good topic: built-up litter versus changing litter at weekly, daily, monthly, or other intervals. First, in a healthy flock, in the absence of disease, as a routine practice.

DR. MARTIN—I would say that both these practices, built-up litter and dropping pits, depend upon good management and good health in the flock. In other words, if disease is present, then it certainly would run its course more quickly in the case where we have anything that is spread through the fecal material, in the event we do not change the litter frequently or allow the droppings to accumulate under the roost.

But many of our poultrymen, with thousands and thousands of birds to serve as checks, have been quite successful with the built-up litter, putting 6 to 8 inches of litter in the house and then going straight through the year, adding more litter as the first becomes contaminated, stirring it up, then adding more, so that through the winter months they have at least 8 inches of litter which acts as a good insulating material and keeps the floor of the hen-house warm.

But it must be kept dry. That involves occasional cleaning of the litter around the watering founts or anywhere that water may be spilt. Damp litter must be removed. It is the dampness of the litter

that is the hazard, as I see it, and not the presence of droppings on the litter.

You all know and have seen many, many cases of hogs and cattle kept on built-up litter, even built-up manure instead of litter in some cases, and there was no great hazard so long as the animals were fed elsewhere, and were not consuming fecal-contaminated material or ingesting feed contaminated by their pen-mates. That is the way I think it is with poultry.

Incidentally, these two practices, certainly during the war, have saved tremendous amounts of labor, and have allowed the farmer with limited labor to take care of more birds and produce more food.

CHAIRMAN CARPENTER—I would like to add this, that in the tenella type of coccidia, the bloody or cecal type, one of the best ways of having it spread through a brood rapidly and one of the best ways of having a high morbidity and mortality rate is to have only about half an inch of litter on the floor.

Many poultrymen who clean their chicken houses every week, as a routine, will tell you that, in the event of an outbreak of cecal coccidiosis, they have changed to the deep litter, starting in with 1 1/2 inches with the day-old chicks and building up to 5 or 6 inches by the time the chicks are 4 to 6 weeks of age, and yet have experienced losses, without doing anything else, of maybe not over 1 or 2 per cent. There, again, is a physical something that enters into it. With a deep litter, the material that is infected or will be infected after twenty-eight to thirty-six hours or more, will be more deeply buried and, perhaps, removed from the exposure to susceptible birds. Whereas, another poultryman may have cleaned out the litter three days ago and, to him, he has a clean brooder house. But, before he cleans again, he will have three or four days for the disease to spread, where he is using a thin litter.

DR. MARTIN—I am glad you mentioned that because it brings up the practice of using built-up litter with chicks. Many of our successful poultrymen in Indiana are using that system entirely. They do not change the litter from the time they put the baby chicks in until the broilers are marketed. They do clean around the water utensils because damp litter is what spreads disease and not litter with droppings. Over in Indiana we call it "scientific neglect."

We used to say we neglected the hen-house when we let the droppings accumulate and let the litter pile up. When I worked on a farm in Wisconsin, the farmer told me that he cleaned his hen-house once a year. I am inclined to believe he had a good idea, but I didn't follow it through. What he should have done was to add considerably more litter—scientific neglect, or, in other words, using your judgment as to when you need to change the litter, and not changing it according to the calendar.

CHAIRMAN CARPENTER—About ten years ago some of us tried to tell the broiler raisers they were going to go broke because of their litter practices. We found out they were right, we were wrong. They brood not thousands or hundreds of thousands of broilers, but miles of broilers. Some of the brooder-houses are a quarter of a mile long. The litter in them is not changed for three months at a time. They do emphasize dryness. A litter can't be looked at with the naked eye to determine when it is dirty, consequently dryness is much more important to poultrymen than so-called litter cleanliness, although dryness is cleanliness in the brooder house.

The depopulation of flocks has been covered, Dr. Martin, do you have anything to add to that, the annual depopulation of flocks?

DR. MARTIN—As I look over the audience, I spot a good friend, H. R. Smith. We have had many a round on keeping old birds to breed—that they are hazards, especially from the standpoint of tuberculosis. While I have recommended breeding from old birds for years, and having longevity as one of the factors for which you select continued laying, through succeeding years, even up to the fifth and sixth year, that program in no way conflicts with the depopulation practice, nor does it conflict with the practice that the Bureau of Animal Industry has recommended for the control of avian tuberculosis.

There are relatively few flocks, especially here in the Middlewest, that need be held over for a second year. The average farmer who gets his chicks from a hatchery will be better off if he will sell all his birds at the end of the first laying year; clean up his house; leave the house idle for a week to ten days, and then bring his pullets in off the range, and put them into houses which have been completely depopulated, so

that infection will not tend to spread or be held over. That was brought out by Dr. Delaplane. It is a practice which we heartily endorse. Hatchery supply flocks are an entirely different matter; then the breeding from old birds and the testing of that flock can be carried out with no conflict whatsoever with this other program.

I think depopulation is one of the important factors in the control of the coryza group of troubles and, also, tuberculosis.

CHAIRMAN CARPENTER—Do you believe that all broods of various ages should be brooded, reared, and housed separately, in the interest of disease prevention?

DR. MARTIN—Most certainly they should be brooded separately except for about a week or ten days.

CHAIRMAN CARPENTER—What will you tell us about the practice of debeaking, with respect to preventing cannibalism?

DR. MARTIN—Debeaking is coming into rather common practice. A commercial poultryman in Indiana is running a very interesting test. Possibly a year from now I can give you more information. He debeaks the upper mandible, cutting off just past the midpoint of the beak, a full half or a little more, and those birds are getting along fine. It doesn't interfere with eating from the hopper. He debeaked a thousand pullets; in the other half of the house, he has another thousand pullets with blinkers; in an adjoining house another thousand pullets with blinders, and still another device in the fourth house. Thus, there are four thousand pullets being compared for cannibalism under four different systems.

Debeaking is becoming popular in California. I think it will also be valuable with pheasants and turkeys.

DR. LEVINE—Have you observed this debeaking practice in poultry poult?

DR. MARTIN—I have not, but I have talked to Dr. Newland of California, and he said it has proved quite valuable in the turkey.

DR. LEVINE—One of the turkey growers in New York State was a little bit too enthusiastic about debeaking. He practically decapitated his birds.

DR. MARTIN—That is an important point. In young poults, if you don't remove half of the upper mandible, it will grow back. If you remove too much, you will injure the bird. You should not debeak the toms or the roosters, for obvious reasons.

CHAIRMAN CARPENTER—There is another point in this debeaking practice in relation to feeding. Don't let the depth of feed in the mash hoppers get down to only 1/2 inch or 1/4 inch, because then the birds will not get the feed. With debeaking, it is important that the birds have a deeper level from which to feed.

NUTRITIONAL PROBLEMS

DR. LUBBEHUSEN, in view of the shortage of animal proteins caused by the war, can vegetable proteins be substituted in poultry rations, and to what extent?

DR. LUBBEHUSEN—Ample research results, supported by field experiments during the last two or three years of shortage of ingredients, particularly of animal proteins, definitely indicate that vegetable proteins do give satisfactory results when substituted for animal proteins. However, I don't want you to get the idea that this substitution may not have some drawbacks.

For chicks during the first six weeks, we like to include in the ration approximately 4 per cent of animal protein, also in the ration of breeders, for increased hatchability. It seems there is something in animal protein which is definitely required.

By way of warning, I want to reiterate a statement which Dr. Biester made yesterday during the swine disease panel, that is, in your consideration of soybeans as a source of vegetable protein, it is important that the processing of that meal be done correctly. If it is not done correctly, you are apt to run into some trouble.

CHAIRMAN CARPENTER—Would you tell just what that trouble is?

DR. LUBBEHUSEN—You simply do not get the full nutritive value of the protein.

CHAIRMAN CARPENTER—In other words, the only vegetable protein that is improved by processing, from the standpoint of its availability to the bird or the animal, is the soybean. Is that true, Dr. Lubbehusen?

DR. LUBBEHUSEN—Yes.

CHAIRMAN CARPENTER—And we do improve and increase, by proper processing, its availability and utilization by the animal?

DR. LUBBEHUSEN—That is right.

CHAIRMAN CARPENTER—Are the nutritional requirements of turkeys, per pound of body weight, greater than those of chickens?

DR. LUBBEHUSEN—Yes. Research during the last few years has definitely indicated

that the nutritional requirements of turkeys are very different from those of chickens, not only as to the amounts of the various nutritive factors required, but also in the clinical manifestations of the deficiencies in turkeys. For example, the nutritive requirements of turkeys for protein, vitamins A and D, pantothenic acid, riboflavin, and choline, are all greater than in chickens. Most marked differences appear in the vitamin A and vitamin D requirements. There is work to indicate that, in so far as vitamin A is concerned, turkeys require at least two to four times as much as do chickens, and the same is true of vitamin D. The requirement for vitamin D is at least twice that of chickens.

CHAIRMAN CARPENTER—Under average farm conditions, what is the earliest age at which nutritional diseases may be suspected by the veterinarian or by anyone except the farmer? He suspects it all the time, doesn't he?

DR. LUBBEHUSEN—I will answer that question this way. If the breeders have been on an adequate ration, from the standpoint of production and hatchability, and we assume that they have, then their progeny will probably not show clinical evidence of a nutritional deficiency before the age of 3 or 4 weeks. I think that is a highly important point. It is due to the fact that there is a carryover in the egg which supplies all of the necessary nutrients during that three- or four-week period.

CHAIRMAN CARPENTER — What nutritional diseases can be diagnosed accurately by the veterinarian in the field without resort to laboratory examinations?

DR. LUBBEHUSEN—That is a question! I will try to answer it in this way: The field diagnosis of nutritional deficiency isn't a simple matter by any means. Certainly, it goes without saying that it is necessary to have better than an average knowledge in the field of nutrition, particularly as it relates to the clinical manifestations of the various deficiencies.

I would say that one should be able to recognize a vitamin A deficiency in birds which has extended over a protracted period, so that there are what we call atypical lesions of vitamin A, that is, the accumulation of caseous material in the eyes, the development of caseation of the esophageal glands, the kidney lesions, and

the secondary deposits of urates over the abdominal organs. That is diagnostic.

From the standpoint of rickets, I would warn against a tendency of many to call all types of leg disorders rickets. You may have certain indications, as in the bowing of the metatarsal bones, the development of crooked breasts, and the budding of the costal cartilages, that rickets exist. But, we never make a definite diagnosis of rickets, regardless of the clinical picture, without resorting to a bone-ash determination.

As a case in point, I might mention an experience during the current brooding season and, in so doing, call attention to a problem which we have observed in young turkeys. We had called to our attention a peculiar leg condition in turkey poults which developed uniformly during the latter part of the third and the fourth week. I know that 95 per cent of veterinarians, including myself, would without hesitation, have called the condition rickets; it gave that clinical picture, and yet, upon bone-ash analysis, there was no evidence of rickets in the birds.

I think you can diagnose slipped tendons, or what is known as perosis, without great difficulty. You can also spot dermatitis and diagnose it, I believe, without too much hesitation.

CHAIRMAN CARPENTER—Under what condition, Dr. Lubbehusen, may the feed formula or the sack of feed at the farmer's brooder-house or laying-house be nutritionally adequate and yet nutritional diseases appear in the flock or the brood?

DR. LUBBEHUSEN—That is a good question. I believe it can be answered in this way: You may have a nutritionally adequate feed but if you have improper management, or any one of a variety of factors interfering with a normal feed intake, then you will have evidence of a deficiency; at least the birds will not be up to par in physical condition. Then, again, there is the matter of assimilation of the feed that is ingested. In other words, in enteric diseases, a nutritional deficiency may appear as a secondary condition.

If I may again refer to the medication or adulteration of an otherwise adequate ration with drugs, even with all good intentions, I would emphasize that there may be a detrimental action in two ways: first, dilution of the feed and, second, inhibition

of normal assimilation, as in the case of sulfur rickets.

CHAIRMAN CARPENTER—May I add one more point about proper feeding: the need for a nearby and adequate supply of water at all times.

TURKEY DISEASES

CHAIRMAN CARPENTER—Now to turkey diseases. Dr. Pomeroy, I want to ask you this question with regard to pullorum disease: What advice should a practitioner give a turkey breeder or a turkey hatcheryman, with respect to securing breeding stock, baby poults, or hatching eggs, and with respect to pullorum disease prevention?

DR. POMEROY—As far as pullorum disease in turkeys is concerned (and I am speaking of the Middlewest as I know nothing of what occurs in the East, the South, or on the West Coast), it is our No. 1 problem in turkey poults, at least in Minnesota.

Pullorum, paratyphoid, and typhoid, in that order, are the three infections, organisms, or group of organisms belonging to the *Salmonella* group that are probably responsible for 75 per cent of losses in turkey poults during the first three to four weeks. That is contrary (according to what I read) to occurrences in California and the West Coast. Pullorum disease in turkeys there appears to be a museum specimen.

There is now being set up a National Turkey Improvement Plan. Dr. Hinshaw, of California, has been one of the sponsors of this plan as far as the pullorum-disease-control phase is concerned. The plan is in the growing stage at the present time and has not yet been adopted by all the states. I believe last year there were only thirteen states that cooperated under the National Turkey Improvement Plan, and many of those states are not cooperating on the pullorum-control phase of the program, but simply on the breeding phase. However, progress is being made in that direction.

This year, at a planning conference, the program was set up to include four classes or four types of pullorum-disease control to conform with the National Poultry Improvement Plan. It would recognize four types of flocks: the pullorum-tested flock, which would indicate a tolerance flock, allowing for less than 6 per cent infection in that flock. The second type would be the pullorum-control flock, allowing for less

than 2 per cent infection in the breeding flock. The third, the pullorum-fast flock, which would give an opportunity to an infected flock, through repeated testing, to become pullorum-clean. Fourth, the recognized pullorum-clean flock.

I think there is only one recommendation to the hatcheryman: that he recommend to his turkey breeders that they qualify for the pullorum-clean class. If he does that, he will eliminate a lot of his trouble.

CHAIRMAN CARPENTER—The second question: How can a practitioner differentiate between pullorum disease and paratyphoid in poults, or can he?

DR. POMEROY—I wish at times we could even do that in the laboratory, but I think there are certain lesions that may be ascribed to pullorum disease and certain lesions that may be significant of paratyphoid. It must be kept in mind that, at least in Minnesota, we find a good many outbreaks in which both pullorum and paratyphoid are involved and which may have more than one type of paratyphoid. But in uncomplicated cases, pullorum disease is characterized by the formation of caseated abscesses along the intestinal tract, in the liver, on the heart and in the lungs.

With uncomplicated paratyphoid, you do not see the formation of caseated nodules on the heart or in the lungs; nor, which is very helpful, do you see the cecal core or cecal plug which, again, is significant of a *Salmonella* infection and does not necessarily mean pullorum or paratyphoid or typhoid.

CHAIRMAN CARPENTER—What is new in the control of blackhead in turkeys?

DR. POMEROY—The only thing that is new is the use of phenothiazine, which is used simply to rid the turkey of the cecal worm but has no effect on the protozoa causing blackhead.

CHAIRMAN CARPENTER—Nor on the course of the disease?

DR. POMEROY—Nor on the course of the disease in the flock.

CHAIRMAN CARPENTER—Dr. Neuzil, are you in agreement with Dr. Pomeroy with respect to pullorum and paratyphoid and his comment on blackhead?

DR. NEUZIL—Practitioners are sometimes put on the spot regarding pullorum disease in turkeys. We suspect pullorum disease in poults, but we still have to rely on a laboratory diagnosis before being certain.

Pullorum disease is also a serious problem in the turkey industry in Iowa, judging from observations I have made in my locality and in other localities.

The purchase of eggs from so-called tested flocks, pullorum-tested flocks, hasn't been satisfactory in my particular area, and the problem of getting pullorum-free turkey eggs is becoming greater and greater every year. Consequently, this year our turkey production dropped about 60 per cent.

CHAIRMAN CARPENTER—You are not speaking for the whole of Iowa?

DR. NEUZIL—No, I am talking about my particular locality. The same thing is true with pullorum disease in chickens.

As far as diagnosis of the disease in turkeys is concerned, the hatcheries refuse to take our diagnosis without a laboratory examination, while in the case of chickens, I think I can diagnose pullorum disease in about 99 per cent of the cases, providing I have an opportunity to get all the history and to observe the flock itself.

CHAIRMAN CARPENTER—Dr. Tucker, do you have anything to add to that with respect to turkeys?

DR. TUCKER—The turkey industry has developed rapidly in the last few years, and I think it behooves practitioners to acquaint themselves with these turkey problems. In my area, the turkey phase of practice has increased considerably in the last year or two.

CHAIRMAN CARPENTER—I might add that the turkey industry, almost overnight, went from an annual value of 70 million dollars to 200 million dollars. One final point in connection with turkey diseases. I will ask Dr. Pomeroy to treat the first phase of it, and Dr. Delaplane the second. Sinusitis in turkeys is an increasingly important disease; it is also called swelled head, turkey roup (which I trust you do not call it), infectious colds, and turkey coryza. Those named are offered simply to let you know that we are all talking about the same thing when we talk about sinusitis.

Dr. Pomeroy, what is the injection method for treating sinusitis in turkeys and how it is applied?

DR. POMEROY—The injection method is the using of one or two preparations, 4 per cent silver nitrate, or 15 to 20 per cent argyrol solution. The contents of the sinus are aspirated with one syringe, and then the sinus is filled with one or the other of

these solutions, using a second syringe. As a rule, we recommend the use of argyrol because of the hazard to the operator in using silver nitrate. However, silver nitrate gives better results, with less need of a second injection.

CHAIRMAN CARPENTER—Do you find it is important to treat cases early, before they reach the caseous stage?

DR. POMEROY—Absolutely. Otherwise, if they become caseous, the only thing that can be done is to open the sinus, drain it, and pack it.

CHAIRMAN CARPENTER—Now, Dr. Delaplane, what therapy would you recommend in treating these cases or preventing spread?

DR. DELAPLANE—My experience has been rather limited and so are the data which we have at the present time. You probably know that the etiology of sinusitis of turkeys has not been established. However, recently we have found an organism in three widely separated flocks in Texas, but we do not say that this organism causes all turkey sinusitis. In the particular flocks in which that organism is found, sulfathiazole (I am speaking of mature birds now, because sulfathiazole is rather toxic to younger birds, and the dose must be cut down materially) will obtain a response. Birds will recover in approximately six days, providing there are no accumulations of caseous material in the sinuses.

There is one other advantage to this form of treatment. Often in outbreaks of infectious sinusitis in turkeys, we have lower respiratory involvement without any infection of the sinuses. Of course, I will admit that Dr. Pomeroy's form of treatment is the one of choice at the present time. But where we have lower respiratory involvement, naturally it is not applicable. In the infection with which we have worked, sulfathiazole has proved of considerable value in hastening recovery. Whether or not it can be used to advantage under other situations, I cannot say.

You might want to try it on a limited number of birds. The dose which we have used—and it may not be the final answer—has been 1 Gm. of sulfathiazole in the morning and 1 Gm. at night, per bird; or, if it is to be mixed with the feed at the rate of approximately 1 per cent, it will require approximately ten days for any noticeable recovery.

I do not say that all turkey sinusitis is produced by this organism. I have mentioned it for the simple reason that once upon a time we thought that all of the colds and roup were due to the same cause. This afternoon I think I pointed out that we have several distinct, etiologic agents responsible for our so-called colds of poultry, and I would be hesitant to say that this might not also be true in turkey respiratory infections.

CHAIRMAN CARPENTER — Dr. Delaplane, would you recommend the use of sulfathiazole in connection with the aspiration-injection method?

DR. DELAPLANE—Some people have used both; in other words, they did not like to use the sulfathiazole, particularly when they had to use it individually, because it meant handling the birds more frequently. In those instances where there was typical sinusitis, they followed Dr. Pomeroy's suggestion, but in those instances where there were lower respiratory involvements, they used the sulfathiazole. Of course, some individuals who are rather lazy prefer to put it in the feed—in both instances, apparently with good results. Experimentally, we find in the laboratory that our results bear out what we saw in the field.

CHAIRMAN CARPENTER—One final question of Dr. Pomeroy. Do you recommend the whole-blood or rapid-antigen method of detecting carriers of pullorum disease in turkeys?

DR. POMEROY—The National Turkey Improvement Plan recognizes the tube test and the rapid serum plate test performed in the laboratory. It does not recognize the rapid, whole-blood test as effective enough to qualify as the official test. However, I feel that the rapid test, if properly conducted, could be used as the locator of flocks that might be clean. If you find infected birds by the plate test, then that flock should be passed up as a source of breeding stock.

POULTRY PRACTICE

CHAIRMAN CARPENTER—Now we come to some questions aimed specifically at poultry practice.

Dr. Tucker, how do you diagnose pullorum disease in baby chicks in the field?

DR. TUCKER — In making a postmortem examination of chicks, the first thing I would look to is the age of the bird. There

aren't many diseases that will affect chicks 2 or 3 weeks of age.

In opening up the abdominal cavity of pullorum-infected chicks, the first thing you will usually observe is an enlarged liver, but this is not always present.

We also find the cecal plug, that Dr. Pomeroy mentioned in chicks. That is quite often a lesion of pullorum disease. Then we often find what I call "blisters" on the heart muscle. Another lesion that I look for before making a positive diagnosis of pullorum disease is the little, yellow necrotic areas on the surface of the lungs. These are some of the things that should be recognized in making a diagnosis of pullorum disease.

CHAIRMAN CARPENTER—Do you recognize any grayish areas in the lungs? You spoke of them as yellowish areas.

DR. TUCKER—They are, possibly, not yellowish but little, necrotic areas that are very easily observed and they are significant of pullorum disease.

CHAIRMAN CARPENTER—I think, in order to keep the record straight, you made some reference to cecal plugs. I think I also heard somebody in the panel this afternoon make reference to cecal plugs in connection with paratyphoid. Are cecal plugs found in both diseases?

DR. POMEROY—Cecal plugs are found in both diseases. In fact, I would say that with any *Salmonella* infection, whether typhoid, paratyphoid, or pullorum, you may find cecal plugs.

CHAIRMAN CARPENTER—You wouldn't say they are specific for either of the two diseases?

DR. POMEROY—No, I would not. Sometimes cecal plugs will be encountered in individual birds, from which neither pullorum nor paratyphoid can be isolated but, as a rule, the cecal plug indicates a pullorum or a paratyphoid infection.

CHAIRMAN CARPENTER — Dr. Tucker, what do you recommend to your clients when you have diagnosed pullorum disease in a brood of chicks, let's say, 10 days old?

DR. TUCKER—As far as treatment is concerned, medication is of no value. For prevention, there must be good brooding management, well-ventilated houses, well-ventilated stoves, plenty of feeders, and, above all, plenty of good, clean, drinking water at all times.

CHAIRMAN CARPENTER — What man-

agement practices do you recommend to your client in handling coccidiosis outbreaks in the brooder house, we will say?

DR. TUCKER—That is chiefly a management problem. I recommend moving the brooder-house, if possible, to clean grounds. If I make a diagnosis of coccidiosis in a brood of chicks, I like to sit down with the client and go over the life history or life cycle of the coccidia with him. In so doing, he will better understand what sanitation and flock management will accomplish. I see if we can't change the range, thereby breaking the life cycle of this organism, while the organism is outside the body, which I think is the best mode of attack; also, see if we can't move the house to clean grounds; keep everything clean and dry, with plenty of good, clean, fresh drinking water; wash out the drinking fountains daily, and keep up the intake of feed on these birds. Those are the things about which I like to inform my clients.

CHAIRMAN CARPENTER—Dr. Neuzil are you in agreement with Dr. Tucker's recommendations?

DR. NEUZIL—First, going back to the control of pullorum disease in baby chicks, I think the first thing is to make sure that every visibly sick bird in the flock is destroyed. Do a good job. From then on you will have better results.

As far as coccidiosis is concerned, I do the same as Dr. Tucker. I give the poultry farmer and his wife a good talk on the life cycle of the parasite, and tell them they have done a poor job so far on poultry husbandry, because, for example, their brooder-house is too close to their old flock; I have them move the birds out and move the brooder-house out on the "back forty," if necessary. Then I have them move their feeders and waterers, every day, from one side of the brooder-house to the other.

We still use buttermilk or cheese as a "flush" in Iowa, at least when we can get the buttermilk. I like that treatment, and I am not ashamed to say that, along with it, I still use a little medication for the farmer's benefit.

CHAIRMAN CARPENTER—You mean instead of for the benefit of the chicks?

DR. NEUZIL—Yes. I give him some as astringent to put in the drinking water. If I do not do that, he will go and buy it somewhere else, and use it anyway.

CHAIRMAN CARPENTER—There is considerable "philosophy" in poultry practice

and part of it is: Will the hardware dealer do the job you were trained to do or will you do a better job than he? It appears that we are justified in getting the job done so that the farmer can make a profit from his birds. I am not going to argue with the practitioner who prescribes something for the drinking water, provided he doesn't leave the impression with the farmer that it is the magic of the drops that went into the drinking water that is going to do the trick.

DR. TUCKER—I don't object to milk products in the ration of these coccidia-infected chicks. As a matter of fact, I recommend it, and have ever since I first heard Dr. J. R. Beach recommend it many years ago.

CHAIRMAN CARPENTER—The question is, does the milk or its lactic-acid content tend to change the flora of the intestine, thereby making it more difficult for the coccidia or other secondary organisms to exist?

DR. LUBBEHUSEN—I doubt that, for the reason that the pH of the intestinal tract of the bird is normally acid. Again on this matter of milk feeding, I do not want to be misunderstood. My criticism of milk feeding is not in the milk itself but the manner in which it is used. If you feed milk and do not get a too laxative condition, if you use it intelligently for a limited period of time, I am in accord with it, purely on the basis that it may do a lot of good. It keeps the birds at the feed troughs at a critical time. I wouldn't have you get the impression that I am against it on any other basis. We recommend milk in cases where there is nothing else to do, but with a warning to do it right.

CHAIRMAN CARPENTER—I think it can be safely added that the term "milk flushes" was a very unwise name for the whole group of milk products which were recommended for coccidiosis. Too many farmers and a few veterinarians still believe that it is the mechanical flushing out of the coccidia that is the benefit from the so-called milk flush. I think if you will reflect on the pictures shown by Dr. Levine, you will see how impossible it would be to mechanically flush out organisms that are deeply seated in tissue.

Dr. Tucker, is poultry practice profitable?

DR. TUCKER—It is with me.

CHAIRMAN CARPENTER—That was the intent of the question. Dr. Neuzil, is it profitable to you?

DR. NEUZIL—More profitable to me since I have made a practice of going out to the farm and telling the farmer what he must do in the control of poultry diseases, rather than just doing an autopsy in the office and then giving advice based on the autopsy findings. I think that practitioners can build up a good practice, by doing things differently from the rest of the so-called poultry specialists.

CHAIRMAN CARPENTER—Dr. Martin, is poultry practice by the veterinarian profitable to the poultryman?

DR. MARTIN—That is what came to my mind immediately when you asked Drs. Tucker and Neuzil if poultry practice is profitable to them. Of course, we poultry people, speaking for the layman and the poultryman, want you to profit by your ef-

forts, but we are more particularly concerned with the profits from the hens that go into the bank accounts of the poultryman and the farmer.

I cannot speak for the poultryman around Blairstown, Iowa, but I can speak for the poultryman around Claypool, Indiana. I know that, as Dr. Tucker's poultry practice increased, the remedies on shelves in the drug stores in Kosciusko and adjoining counties decreased. The poultryman's profits went up and the druggist's profits went down. Dr. Tucker's income went up, we are happy to say, because it was not only profitable to him but profitable to the farmers who get the benefit of his scientific training and broad experience.

(Conclusion of Panel.)

Guardian Institutes of America's Livestock Empire—the Midwest



—Courtesy of the Live Stock Sanitary Committee

Top left, School of Veterinary Medicine, Texas A. & M. College; top right, School of Veterinary Medicine, Kansas State College; center, College of Veterinary Medicine, Ohio State University; lower left, Division of Veterinary Medicine, Colorado State College; Division of Veterinary Medicine, Iowa State College. [Division of Veterinary Medicine, Michigan State College also belongs in this group.—Ed.]

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

A Device for the Restraint of Mink During Certain Experimental Procedures

O. J. HUMMON, D.V.M., M.S.

Pullman, Washington

IN THE STUDY of disease, more especially distemper, the temperature fluctuations are of prime importance. The initial clinical symptom of distemper is readily obtainable in ferrets due to their more or less docile temperament, thus making them a useful animal for diagnostic purposes.

reliable when the animals are restrained by the conventional methods employed at the minkery. Therefore, an entirely different problem arises when handling mink for disease research.

A new method of restraint for mink has been devised which has proved quite satis-

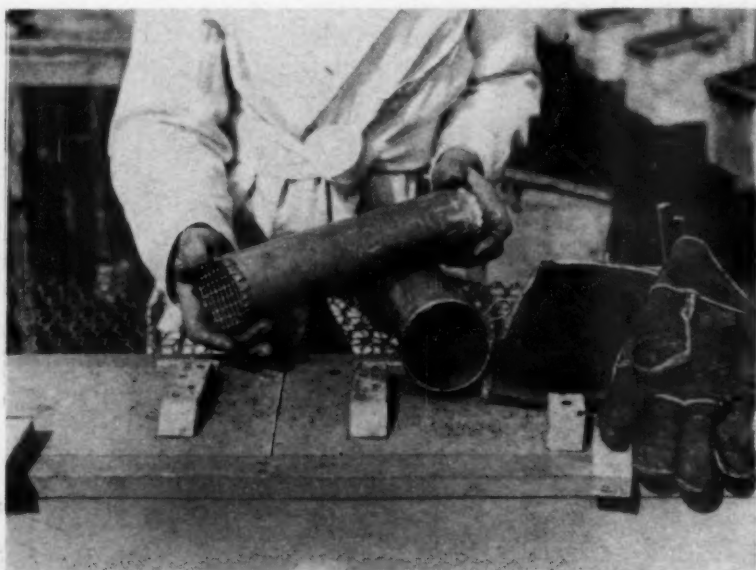


Fig. 1—Showing the general construction of the holding tube, closed at one end with hardware cloth and re-enforced at the open end with a heavy wire.

In the study of distemper of fur bearers, using mink as animals for diagnosis through distemper challenges, the temperature of weaned kits and adults is not

factory. This equipment and the uses for which it was designed are described in the following paragraph. The accompanying photographs show the general appearance of the holding tubes especially designed for the research worker but may be equally useful to the fur rancher in examining mink with the minimum of excitement.

From the U. S. Department of the Interior, Fish and Wildlife Service, Pullman, Wash., and the Coöperative Fur Animal and Wildlife Disease Research Laboratory, State College of Washington.

EQUIPMENT

The equipment consists of a metal tube (18 gauge galvanized iron) open at one end and closed at the other with one-fourth inch mesh hardware cloth. The seams and hardware cloth are held in place with solder. The open end is reinforced with 12 gauge

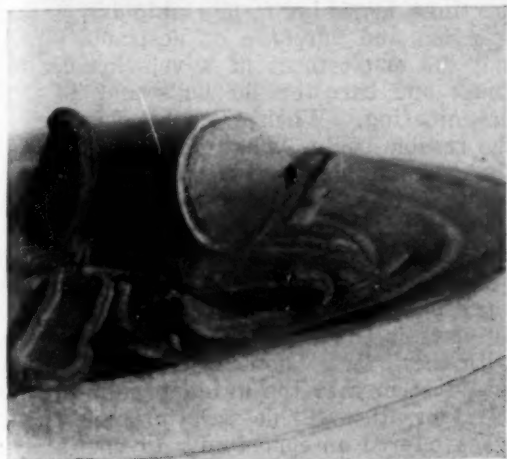


Fig. 2—Alternate construction of the holding tube. By replacing the hardware cloth over the end of the holding tube with an open metal cone, it eliminates the breaking of the wire by the large mink and retains all advantages of the equipment.

steel wire soldered in place with a loop extending approximately one inch from the tube to facilitate the weighing of animals from a suspended balance.

Approximate Dimensions of the Metal Tubes:—Adult male mink—inside diameter, 3 1/4 inches; length, 14 inches. Adult female mink—inside diameter, 2 3/4 inches; length, 12 inches. Half-grown kits—inside diameter, 2 to 2 1/4 inches; length 8 to 10 inches.

With a heavy glove on one hand, the animal's head is held close to the open end of the tube. Due to the inquisitive nature of mink, they will ordinarily enter the tube in an effort to escape. Once the mink is within the tube it invariably remains there quiet and motionless. After the mink has been examined, it can be removed from the holding device by blowing through the end of the tube covered with hardware cloth. Often a quick shake will expel the animal from the tube into its pen. If these methods fail, it can be retracted by the tail.

USES

- 1) To obtain more accurate temperature.
- 2) Taking blood samples from the tip of the clipped tail.
- 3) When it is necessary to anesthetize a mink, it may easily be done by holding a pad of cotton, saturated with a suitable anesthetic over the screened end of the tube. During this procedure the open end of the tube must be tightly covered.
- 4) Vaccinations or inoculations can be given subcutaneously on the inner surface of the hind leg.
- 5) Vaginal smears may be obtained from mink held in this device with little or no undue excitement to the animal.
- 6) When animals are to be periodically weighed at the time temperatures are recorded, this method of restraint eliminates extra handling.
- 7) The equipment can be readily cleaned and disinfected. The smooth metal tubes can be washed clean with running water and disinfected by immersion in an appropriate solution. The metal tubes will readily withstand repeated pressure sterilization in an autoclave.
- 8) The majority of procedures listed herein may be performed by a single operator. The use of the tube has a distinct advantage in the restraint of mink by an attendant.

Insemination Improves Production

The prediction that the offspring of artificially inseminated cows would likely inherit some form of functional weakness from the manhandled sperm was refuted by the report of Dr. J. W. Bartlett, head of the Department of Dairy Husbandry, New Jersey State College of Agriculture, before the annual meeting of the American Society of Animal Production in December. Based on a study of 120 naturally bred cows and their 120 artificially bred daughters, the report showed an increase of 9.3 per cent in milk and 14 per cent in butterfat by the artificially bred cows over the naturally bred ones. Other advantages of artificial breeding were pointed out, such as more calves per ejaculation, and access to better sires, not to mention its convenience to owners of small herds. With the deteriorating blood lines ruled out, artificial insemination as a fixture in dairy husbandry has nothing to fear.

Precocious Heifer

Roy C. Rackley, Jr., practicing at Pelham, Ga., writes: "Enclosed is the photograph of a heifer that gave birth to a dead but otherwise normal calf October 11, 1944,



—Photo by Dr. Packley

Fig. 1.—Heifer belonging to W. H. Brown, Pelham, Ga., that gave birth to a dead calf of normal size at the age of 11 months and 16 days.

before she was a year old on October 27. Although not registered, the date of her birth was definitely known by the owner, W. H. Brown, of Pelham. I took the photograph when called to remove the afterbirth. I report this case after having read of a heifer that delivered a live calf at the age of 1 year and 1 month."

Bovine Artificial Insemination by Practitioners

Fuller (*Cornell Vet.*, Oct. 1, 1944) asks and answers the question, "Why doesn't the veterinary profession take a keener interest in artificial insemination?" In so far as normal cows are concerned, the author declares that any dairyman can be instructed to inseminate his own cows with fair success. In fact, many dairymen believe that a veterinarian's services are not needed, notwithstanding that knowledge of repro-

ductive disorders such as veterinarians possess is essential.

The founding of a "breeding circuit" is a difficult task, involving desire and demand on the part of the dairymen, understanding, discipline, administrative ability, collaboration with the county agent, writing contracts and collecting fees, choosing directors and committees, the holding of meetings, launching membership drives, the selection and purchase of desirable sires, and the employment of a veterinarian to house and care for the bulls and do the inseminating. When everything is ready the trouble begins, what with barren cows that are now expected to breed forthwith, disappointed clients, nonproductive semen, cysts and retained yellow bodies, pyometra, malnutrition, the keeping of complete records, and fitting all this extra work into one's practice. The cost of equipment for 10 cows is the same as for 1,000. Faced with these facts knowingly (quoting), "It would seem that the graduate starting in rural practice will do well to think twice when offered an opportunity to take a circuit." On the other hand, the connection affords the opportunity to contact prospective clients and perhaps justifies the employment of an assistant. Moreover, serving the dairymen in this respect "is doing your bit for the profession by keeping the work just as much as possible in the hands of veterinarians."

The JOURNAL values highly the occasion to pass along the author's views in this section, based as they are on personal experiences in a field currently important to the future of clinical veterinary medicine, since practicing artificial insemination, as pointed out, will block another one of those "break throughs" in the profession's line of defense. The veterinary service of the United States has already "missed the boat" too often where there were new trails to blaze. After a while it will be too late.

Animals with low plasma protein reserves are poor surgical risks, because, in addition to the low preoperative level, major operations cause heavy nitrogen losses which still further depress the regenerative process.

CLINICAL DATA

Clinical Notes

Vitamin K, in therapeutic doses, has little if any effect on the coagulation of the blood of normal persons.—*J.A.M.A.*

One out of every seven bushels of hog feed is wasted because 4 pigs out of every 10 born never get to market. . . . For each pig dead at birth, 140 lb. of feed is wasted; at 10 weeks, 260 lb.; at 18 weeks, 360 lb.; at 26 weeks, 602 lb.; and at 34 weeks, 990 lb.—*From Hoard's Dairyman.*

The transmission of tuberculosis by man to four different herds of cows within a period of two and a half years is reported by Tice (*Cornell Vet.*, Oct., 1944). The organisms recovered from both the man and his cows were of the bovine type; in the man from sputum, and in the cattle from lymph nodes. The human case was pulmonary—consumption.

Nervous Canine Distemper and Aroused Latent Infection?

Contrary to beliefs that encephalomyelitis in dogs is an expression of canine distemper virus, Oakley (*Royal Society of Medicine*, Sept. 1944) suspects that the recovery of canine distemper virus from cerebral distemper cases, with nerve-cell degeneration and neuronophagy, is accounted for by the presence of two diseases—the distemper virus has merely activated another latent infection that is neutralized by antibodies for the virus in a large proportion of adults, as is true of poliomyelitis of man. The author expresses surprise that others have succeeded so well in recovering canine distemper virus from cases of encephalomyelitis in dogs. He and others have not been that successful.

The synthesis of vitamins, especially thiamin and riboflavin, by the action of the natural intestinal bacteria, which has been demonstrated by Elvehjem, University of Wisconsin, can be set down as one of the outstanding achievements of the biochemist.

Paris green (=copper acetoarsenite) has been found to be highly toxic for mosquito larvae. It is widely used by the armed forces for that purpose in the South Pacific. One ten-millionth of a grain will kill a mosquito larva.

Cylinders of compressed insect-repelling gas, two inches long, may be available for home use after the war. The design is the same as the cylinders of carbon dioxide sold for home preparation of carbonated waters.—*From Food Industries.*

Cobalt Deficiency

The studies of cobalt deficiency among cattle in the Upper Peninsula of Michigan, by McIntyre, Duncan, Reid, Huffman, and Killham of the Michigan Agricultural Experiment Station, in 1942-1943 are reported in the *Journal of Animal Science* for November, 1944. The symptoms, well known to Michigan veterinarians practicing in cobalt-deficient districts, the authors describe as gradual loss of appetite and rapid loss of thriftiness, and as more frequent in calves than in mature animals. Blood examinations revealed low hemoglobin concentration and erythrocyte alterations, which, along with the symptoms, responded to the administration of cobalt sulfate given in the regular salt ration at the rate of 0.5 oz. to each 100 lb., or in solution, 1 oz. to the gallon of water; given to calves in tablespoonful doses daily for seven days, and teaspoonful doses daily thereafter. The trouble is stopped by supplementing the feed with cobalt.

So-Called Tick Paralysis in Chickens

The literature contains a number of reports relative to tick paralysis (Hermes¹) in sheep, calves, dogs, and man, attributable to the Rocky Mountain wood tick, *Dermacentor andersoni* (Stiles). The occurrence of tick paralysis in western United States and Canada is considered to coincide with the distribution of this parasite. *Ixodes holocyclus* (Neumann) has been reported to cause paralysis among sheep, calves, and dogs in Australia. Tick paralysis in the dog due to the American dog tick, *Dermacentor variabilis* (Say) has been observed in this country.

As far as can be ascertained, tick paralysis, as such, in chickens has not been reported although Bishop² states that an infestation of the common fowl tick, *Argas persicus* (Oken) may cause "weakness in the limbs." During the past five years, so-called tick paralysis has been observed in 14 flocks of chickens associated with infestations of the common fowl tick. Birds of all ages may become affected. The occurrence of tick paralysis in chickens has been associated with ticks in all stages of development in which they feed on the host. In some instances, comparatively few ticks are found on affected birds. Not all infestations of fowl ticks result in tick paralysis. This condition in other species has been attributed to the injection of toxic substances by the ticks during the feeding period. Why tick paralysis develops in some tick-infested flocks and not in others is not known. Symptoms usually do not develop until seven or eight days after infestation occurs.

General weakness resulting in a staggering, listless gait and symptoms which appear to be paralytic are observed. In some instances, the symptoms appear to be more like those of true paralysis than in others. These symptoms are never spastic. The wings and legs are most frequently affected. Observations indicate that these so-called paralytic symptoms probably are more those of general weakness than of true paralysis. Weakness rapidly becomes progressively more pronounced regardless of the number of ticks until affected birds assume a sitting position. They become drowsy, cannot be aroused, and show evidence of toxemia. The rate of mortality often is high. The

period of illness usually varies from twenty-four to seventy-two hours.

The removal of the ticks from affected birds results in miraculous recovery usually within twenty-four hours. Birds which apparently have been near death have been observed to make a complete recovery after the removal of the ticks. Thus, when this condition occurs among tick-infested birds, it is important that prompt measures should be used for the removal of ticks from the birds as well as for the control of these pests in their hiding places.

Tick paralysis at times may be confused by the laity with true fowl paralysis. However, as stated previously, the initial symptoms appear more as those of general weakness than true paralysis. Tick paralysis is more rapid in its course and often a much higher percentage of birds become affected than in true fowl paralysis. Tick paralysis always should be suspected in tick-infested flocks.

Brown and Cross³ have described outbreaks of paralysis in birds exposed to fowl ticks which had previously fed on paralyzed birds and concluded that fowl ticks are probably agents in the transmission of true fowl paralysis. In pens infested with fowl ticks, 111 of 120 birds developed paralysis. When true fowl paralysis is involved, this is an exceedingly high percentage of affected birds. The injection of a suspension of macerated ticks resulted in the development of paralysis in twenty-one to twenty-nine days. This is a rather short incubation period for true fowl paralysis under natural conditions except in the case of young chickens. In the experiments of Brown and Cross, the possibility of tick paralysis was not sufficiently eliminated to warrant the conclusion that true fowl paralysis can be transmitted in this manner.—M. W. Emmel, M.S., D.V.M., Florida Agricultural Experiment Station, Gainesville, Fla.

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Next to disease, the greatest drain on the income of the livestock industry is the feeding of "boarder" cows.

Encephalitis in a Heifer Caused by a Pasteurella Organism

H. E. KINGMAN, D.V.S., M. D.V.

Cheyenne, Wyoming

The patient was a Hereford heifer, 7 months old, one of a group of 75, raised without contact with outside animals. With the rest of the group, she had received hemorrhagic-septicemia mixed bacterin prior to weaning. The ration was alfalfa hay and a medium amount of grain.

Apparently well on Jan. 4, 1942, she was found desperately sick on the morning of Jan. 5, 1942. Her gait was wobbly, attitude and expression greatly depressed, and temperature 106.5 F., rising to 107 later in the day. Respiration was not seriously disturbed. Upon slight exertion, she fell to the ground in a severe convulsion, characterized by blepharospasm, opisthotonos, and clonic contractions of the flexors of the limbs.

During the first 24 hours, she received 420 gr. of sulfanilamide orally. The next morning, her temperature was 103 F. There were no further convulsions at any time, so far as observed, and it was thought that there was some improvement. One hundred twenty grains of sulfanilamide during the second 24 hours brought no further change in her general condition. Loud gritting of the teeth suggested a cerebral disturbance. The suddenness and severity of the attack, as well as the absence of disease in other members of the herd, contributed to the difficulty of diagnosis. In view of the possible relations between the nervous symptoms and a calcium deficiency, determination of serum calcium and serum phosphorus was made, with findings of 11.1 mg. of calcium per 100 cc., and 7 mg. of phosphorus per 100 cc., amounts which are considered to be within normal limits. A differential leucocyte count made on the second day showed the moderately increased neutrophile count of 56 per cent with the remaining 44 per cent divided among small and large lymphocytes, mononuclears, and young forms, probably precursors of the neutrophile. By the seventh day, the percentage of neutrophile polymorphs had risen to 65, lymphocytes were 33 per cent, monocytes and eosinophiles each 1 per cent.

Treatment was continued with sulfanilamide, 120 gr. daily, through the fourth day;

fluids were supplied in the form of water, milk, and a strong infusion of tea, to which was added a half ounce of cod liver oil. Her condition grew worse and, on the seventh day of illness, she was taken to the Colorado State College veterinary hospital. Unable to rise or to prehend food, she was destroyed.

At autopsy, lesions were found in only two organs. The mucosa of the abomasum showed several superficial ulcers, linear in form and resembling partly healed scratches. Histologic examination showed them to go no deeper than the superficial one-fourth of the mucosa, and to be filled with a scab of coagulated fibrin. They were, therefore, thought to be of minor importance although not incapable of serving as a portal of entry for pathogenic organisms.

Upon gross examination, the brain was found to have an area of softening and liquefaction, roughly 10 by 15 by 3 or 4 mm., in the left thalamic region. No actual pus was detected by the naked eye. The right lateral ventricle was distended beyond its normal size by a viscid fluid, with fibrinopurulent material adhering to its lining. Microscopic sections of the affected areas showed that the thalamic lesion involved not only softening and liquefaction but was essentially an abscess. In addition to large numbers of lipoid-containing phagocytes (gitter cells) and an extensive gliosis and fibrosis of the surrounding tissue, the central area presented a marked purulent reaction, with foci of pure pus. The reaction in the ventricle was similar. The perivascular lymphocytic infiltrations, characteristic of a virus type of diffuse encephalitis, were absent.

Cultures from the affected brain tissue all gave exclusively an organism of the Pasteurella group. Bipolar, gram-negative, nonhemolytic, it produced acid with dextrose and with sucrose, but none with lactose, dulcitol, or salicin. Production of indol was negative, contrary to the usual findings for this genus. The culture was pathogenic for a rabbit, death resulting thirty-six hours after intravenous inoculation.

CONCLUSIONS

We believe this to have been a case of acute brain abscess caused by a member of the Pasteurella, or hemorrhagic-septicemia class of organisms. While the location of the lesion deep in the brain with no evidence of olfactory, acoustic, or optic involvement points strongly to hematogenous origin, the portal of entry or primary seat of infection remains a matter for speculation.

I am indebted to Drs. Hilton Smith and A. W. Deem, Veterinary Department, Colorado State College, Fort Collins, Colo., for the report on autopsy findings, laboratory work, and interpretations.

Ornithosis and Psittacosis

Among the specific infections transmitted to man by animals is the virus disease of psittacine birds, which some medical authors prefer to name *psittacosis* and an identical infection transmitted by other birds to which the name *ornithosis* has been given. The two words, however, are not that consistently used in current literature. In the psittacine group are parrots, parakeets, lovebirds, canaries, and finches, and in the other are pigeons, doves, and chickens. In veterinary medicine, the importance of this virus is its alleged universal occurrence in pigeons and the considerable number of atypical pneumonia cases (human) attributed to it. It was K. F. Meyer of the George William Hooper Foundation, University of California, who first discovered the virus in birds other than the psittacines.

Ornithosis in man is a serious but not highly fatal disease. Transmission is *via* the respiratory tract either by direct contact or exposure to the dust of infected droppings. The period of incubation is from eight to fourteen days and the course one to five weeks. The symptoms are headache, backache, myalgia, pleuritic pain, chills, anorexia, vomiting, sometimes epistaxis, fever (102 to 105 F.), and general malaise; occurrence, sporadic and of increasing frequency. Atypical pneumonia of this category does not respond to sulfonamides, and penicillin remains untried.

Levison, Gibbs and Beardwood (*J.A.M.A.*, Dec. 23, 1944), reporting 6 cases in Philadelphia, remark that ornithosis has been identified as a clinical entity only during the last ten years and that obviously some cases are unrecognized.

The isolation of the virus of ornithosis in clinically identified cases of human pneumonia gives prestige to the foresight of the United States Bureau of Animal Industry, which maintains strict quarantine against the importation of psittacine birds.

Hog Cholera in 1944—A Warning

The hog crop of 1944 was 82,000,000 head in round numbers, as compared with 122,000,000 head in 1943, the record year of all time. It is estimated that about 40,000,000 head were vaccinated with serum and virus since, in the first nine months of 1944, the United States Bureau of Animal Industry released 1,286,405,000 cc. of antiserum. The results, as announced Nov. 29, 1944, by Dr. W. M. MacKellar, in charge of hog-cholera work, were comparatively few losses for the year. The percentage of hogs vaccinated was about 43 per cent of the total crop, or 3 per cent fewer than were vaccinated in 1943. Farmers are warned against relaxing their vigilance against cholera, since less than half of the hogs of the United States are protected against that disease. History may repeat itself. Hog cholera increases and recedes in a wavelike manner, according to the percentage immunized.

Of the 1944, hog-cholera situation, the Advisory Committee of the Eastern Iowa Veterinary Association says in a release of November 12: "Many hog owners have neglected to have their droves vaccinated with serum and virus in 1944. This neglect accounts for the costly outbreaks on eastern Iowa farms every week during 1944."

Bacteria Generate a Virus

The theory that infectious viruses are but the toxins of figured bacteria was revived by Rosenow, distinguished bacteriologist of the Mayo Foundation, when he produced an infectious, filtrable agent from pneumotropic streptococci (*Science*, Nov. 10, 1944). The filtrable agent, obtained from 29 separate streptococci cultures derived from human influenza cases and other sources, was passed successively through 6 to 18 serial passages in mice. The possibility of the agent being a pickup was excluded by technical precautions which the author describes.

NUTRITION

MATERIAL FURNISHED BY THE COMMITTEE ON NUTRITION

Nutrition in Prenatal Development—I

NUTRITIONISTS customarily regard the needs of pregnancy as being those of a normal, unencumbered woman plus an additional allotment for fetal demands, particularly during the later half of pregnancy. They have known for a long time that, under certain dietary deficiencies, the developing fetus can make use of maternal tissues as a source of missing nutrients. However, it is now well established that this protective mechanism is not operative in all types of deficiency. It has been shown that poor pregnancy diets are probably more detrimental to the fetus than they are to the mother,¹ and recent research indicates that the presence of structural abnormalities in newborn animals can be attributed to a specific dietary deficiency².

PROTECTIVE ACTION OF RIBOFLAVIN

In 1940, Warkany² published a preliminary note in which he reported that 35 per cent of the offspring of rats reared and bred on a deficient diet had congenital abnormalities. Other animals of this same strain produced normal offspring when fed the regular stock diet. When liver was added to the deficient diet, subsequent pregnancies were entirely successful. These results prompted the conclusion that the original ration lacked a dietary essential which was present in liver. In order to determine the identity of the factor, additional experiments were undertaken.

An exploratory study revealed that cod liver oil, alfalfa leaf meal, liver ash, wheat germ oil, manganese, iodine, and casein all were ineffective, whereas liver extract entirely prevented the appearance of the conditions. The negative findings suggested, however, that one of the water soluble B-complex vitamins might be the

preventive agent. Subsequent tests revealed that the omission of riboflavin from the ration was associated with the appearance of malformations. When riboflavin was fed as a sole supplement to the original diet, complete protection was given. Supplements of thiamin, niacin, pyridoxine, and calcium pantothenate were unable to correct the deficiency. The incidence of impairment was considerably decreased, however, when thiamin or niacin were added as single supplements, due probably to a limited protective quality or a sparing action *via* intestinal synthesis of riboflavin.

Feeding a synthetic, riboflavin-deficient diet² instead of the original mixed diet resulted in the production of 33 abnormal young among 137 progeny. All of the offspring of the control animals receiving the riboflavin supplement were normal. On continued feeding of this synthetic deficiency diet, cessation of the estrus cycle was observed in about one half of the animals. Feeding small amounts of riboflavin "restored" some of these animals, and they were bred subsequently. The discontinuation of this vitamin after breeding led to the appearance of congenital abnormalities in 54 per cent of all of the offspring produced under these conditions.

MULTIPLE NATURE OF DEFORMITIES

The structural abnormalities induced by Warkany³ varied considerably in aspect, but the incidence of many of the types was very high. Absence, or shortening, of the tibia were observed in 93 per cent of the abnormal progeny. Impaired development of the lower jaw occurred in 80 per cent of the animals, and absence of the ulna and the fibula were commonly noted. Developmental failure and fusion of the ribs were seen in over 50 per cent of the abnormal young. Greater than 50 per cent

Excerpts from *Dairy Council Digests* dated September, 1944 (Digest No. 1, Vol. 16).

incidence of malformations of the radius and of failure in hand development also were observed. The incidence of obvious cleft palate was 44 per cent, but this figure may have been low since it did not include posterior clefts which could not be detected by inspection. Other bony defects involving the arm, shoulder, and collar bone also were reported.

Histological studies indicated that all of the skeletal changes were characterized by a delay in ossification, and "the orderly relationship between the calcifying cartilage and the osseous parts of the bones was definitely disturbed."³ That riboflavin is necessary for the conversion of cartilaginous structures into normal bone seems obvious, but to what extent this developmental rôle of riboflavin can be applied to other tissue differentiation is not known. The studies of Warkany were devoted primarily to the skeletal parts, and a thorough examination of soft tissue was not made. However, in rare cases certain obvious soft-tissue defects, like incomplete closure of the abdominal cavity, were recorded.

INTERPRETATION OF RESEARCH EVIDENCE.

Attention should be given to the fact that, at most, only 54 per cent of Warkany's riboflavin-deficient animals produced defective young. It also should be pointed out, however, that many of the animals which were originally placed on the diet failed to become pregnant at all. Apparently, the maternal riboflavin reserves permitted only the maintenance of the adult animal body. The rats which produced abnormal young probably had enough riboflavin stored to allow for reproduction but not enough to guarantee normal offspring. While it is possible that the normal pregnancies observed in 46 per cent of the animals were due to excellent vitamin stores, it is more likely that additional factors were involved. For example, resorption of fetuses, bacterial synthesis, and coprophagy, as unusual sources of riboflavin, could help to account for the variations observed.

As far back as 1921, experimentally induced congenital defects in pigs were studied by Zilva⁴ and later by Hale⁵, and others. At that time, because the diets used had been extremely deficient in vita-

min A, it was thought that a lack of this vitamin during pregnancy was responsible for the fact that many of the young were born with cleft palates and without eyeballs and/or hind limbs. However, careful scrutiny of these vitamin A deficient diets now reveals that these diets were also deficient in riboflavin. What little of this vitamin was present probably could not be absorbed efficiently because of the functional impairment which occurs in the intestinal tract in the absence of vitamin A. Substantiation of this interpretation may be found in the work of Cannon,⁶ who failed to duplicate these results. This discrepancy might have been due to the fact that Cannon's vitamin A deficient diet contained a liberal amount of yeast, a rich source of riboflavin.

SUMMARY

1) Congenital malformations have been produced experimentally by feeding riboflavin-deficient diets to animals.

2) The induced abnormalities, which were nonhereditary in origin, were similar to congenital deformities commonly observed among human beings.

3) It is possible that human congenital deformities might be traced to the limitations of riboflavin-rich foods, such as dairy products, green vegetables, and certain cuts of meat, in the prenatal diet of the mother.

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On the basis of body weight, the vitamin A requirement of calves is approximately twice that of pregnant cows and eight times that of heifers.—*Nutrition News Bulletin*.

EDITORIAL

Apologies Not in Order for Veterinary Education in North America

IT WOULD be a major misfortune were our veterinary profession to live on, stupefied by loose talk about the low ancestry of veterinary medicine in the New World. Veterinary medicine in the United States and Canada never did have softening of the spine. Its only malacia has been mental. In action, veterinary medicine has been two-fisted and powerful. No learned profession can boast of more significant achievements than the mastery of tick fever, bovine tuberculosis, glanders, dourine, scabies, foot-and-mouth disease, hog cholera, and the other animal plagues which are paying off in the abundance our country enjoys in these tragic hours.

Veterinary medicine grew up alongside the other professions and at the same rate—more often keeping ahead than lagging behind. Yet, untutored in its own short history, members of the veterinary profession continue unwisely to stress incompetent education as the cause of its alleged imperfection, overlooking entirely that both veterinary science and its application have consistently kept pace with medicine, dentistry, law, theology, and pharmacy. Down in proud Ohio, in the very shadow of Wooster and Oberlin, the physician of this writer's family qualified for practice fifty years ago by "reading medicine" with a village doctor seven miles away. His name was Roth and his tutor was a German quack named Peters. Both became locally prominent and wealthy men. Place: Mt. Eaton, Wayne County and Winesburg, Holmes County, Ohio, where the skeptical may go for proof. The dentist "learned his trade" in the office of a local dentist in a village twelve miles in another direction. He was the son-in-law of Physician Roth, and he passed away only two years ago. The preachers of this proud community—Methodist, Presbyterian, Reformed Epis-

copal—were ordained the easy way. A classmate of the writer, who became a prominent lawyer, judge and politician, read himself into the legal profession in a lawyer's office at the county seat. A pharmacist, still living, owner of a big drug store, was registered from drug store experience.

Just before the turn of the century, young men were only beginning to go to two-year medical schools to qualify for medical practice. During the same period, to qualify as a veterinarian, one already had the choice between two- and three-year colleges: Ontario (1862), New York (1875), and Chicago (1883) of the former class, and Montreal (1866), Iowa State (1879), Harvard (1882), Pennsylvania (1884), and Ohio State (1885) of the latter. Requirement for admission was comparable to that of their medical contemporaries. Read what Dr. Chas. Murray, former dean of the Division of Veterinary Medicine, Iowa State College, adds to this important question from the history of Drake University Medical School¹ as of the late 1870's. We quote:

It is a remarkable fact that beginning in the year 1879, there was in operation at the Iowa State College at Ames, Iowa, a college of veterinary medicine with stiffer entrance requirements and a *longer and fuller course of instruction than any college of human medicine in the country* [emphasis ours]. The applicant for admission had to be a high school graduate or pass an examination in subjects usually taught in high schools, and the course for the degree bachelor of veterinary medicine was two years of nine months each, and for the degree doctor of veterinary medicine four years of nine months each. This school afforded the student didactic and laboratory courses in the fundamental sciences (anatomy, bacteriology, chemistry, pathology, histology, physiology, and

¹History of Drake University Medical School by Dr. F. J. Smith, Dean.

embryology) in addition to the practical branches.

The profession will thank Dr. Murray for digging out this gem in behalf of veterinary medicine. Those who attach importance to high morale as a means to an end will not fail to weigh the meaning of this quotation. In short, there is no apology to make for the evolution of veterinary medicine in this country. Its researches have been brilliant, its educational standards par, and its policing audacious and successful. It would be plenty smart for the veterinary profession of 1945 to start building upon truth, and discard the depressing innuendoes.

Biotrepy: New Word for an Old Art

Pharmacy, materia medica, pharmacology—three names, which have crossed the medical screen in that order, now need another alias, a name that would bring the old art of drugging the sick up to date. Paul D. Lamson (*The Scientific Monthly*, Sept. 1944) coins "biotrepy" (*bios*, life; *trepo*, change) as the appropriate title on the ground that drugs are chemicals and have many users in the biological sciences other than physicians. In his fascinating article entitled "Biotrepy: the Goose of the Golden Eggs," the chemist is the layer of the eggs. The erring pharmacologists of modern times have been speaking of "the action of drugs" when they should have been explaining the reaction of the living body to reagents called drugs. When a dose of morphine makes a man sleep, a dog vomit, or a savage run wild with his machete, these are not "actions" of morphine. No, indeed, they are reactions of the organism to the reagent, morphine. Simple as that.

Quoting: "After a cycle of some seven thousand years we are back where we started. We believe once more in drugs. . . . Its [the drug's] primary 'action' in the body is chemical or physical . . . but we have no idea what the chemical reactions of strychnine or morphine in the body are." Pharmacology is not that well established; so to be abreast of the times, it must be replaced, even with a new name, by a biological science based on the reactions of the organism to chemical reagents, the time

having arrived for medicine to change from the old point of view by ridding itself of nonbiological pharmacology—to which one could add, nonbiological chemists and non-chemical physicians. A new discipline, a new point of view must govern the transfiguration.

With its excito- and depresso-motors, cathartics, anthelmintics, and specific microbicides, pharmacology has failed to achieve the dignity of a science while biochemistry, developing alongside, succeeded. Naturally, university funds were withheld for pharmacology but not knowing what to do with the alien branch, it was not entirely discarded. For that, pharmacology is thankful. Now comes the happy day of biotrepy—the fusion of chemistry and biology. The doctor of the future must be a biotrepist. Isn't the organism but an agglomeration of molecules to keep tuned up? Isn't the empirical formula of immunity, health, resistance just around the corner? In short, the chemist dreams of bottles as exact as the multiplication table. And, so goes the theme.

To all this one could add that the physician is keeping his fingers crossed and his tongue on the buccinator. He's been excited before—at the coming of antibiotics, sulfa drugs, and sensational hormones. Being first of all a biologist, the physician sees something far beyond the grasp of chemistry just now. Its name is Life with its inexplicable ways.

Technologist and Technician

The American Association of Engineers has announced a campaign to distinguish technologists from technicians, and it has demanded that the Wagner Act be amended so that technologists will not be bracketed with technicians in labor unions.

"Technologists are professionals and technicians are their assistants, or non-professionals," the engineers point out. Veterinarians will find logic in the suggestion. The veterinary meat inspector, because of his stated professional training, would be a technologist and his lay inspector a technician, and the same distinction would be reasonable as between the veterinary officer and his trained helper in the Veterinary Corps.

Oscar V. Brumley

1876 — 1945

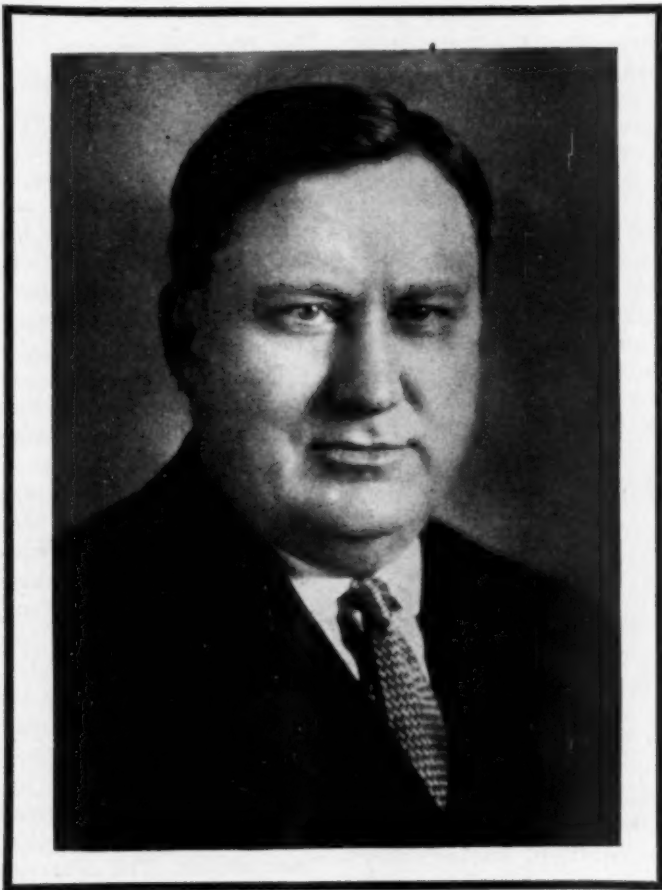
No message could have brought more overwhelming sorrow to American veterinarians than that of January 13, announcing the death in Columbus, Ohio, at the age of 68, of Dean Oscar V. Brumley. Coming as it did after a brief illness, caused by a heart ailment, the message was a shock. All too soon, a good friend, a great leader, and a faithful worker was taken suddenly away while writing impressive achievements into the pages of veterinary history.

Carrying on the good work begun by his predecessors and lifting the College of Veterinary Medicine, The Ohio State University, to the lofty level it occupies among educational institutions may be dismissed, here, as work well done in the line of duty. But, his fearless direction of the American Veterinary Medical Association, first as President, and later as head of the Executive Board for a term of historic years, must forever stand out as the beginning of the current era in which organized veterinary medicine was brought to a new high mark on the scale of public esteem.

His was the master mind of the straight thinker with the knack and determination to plan and to do, come what may—the mind of the scholar and gentleman and capable leader who gets things accomplished.

Inasmuch as only time can fully analyze the force of passing events, this untimely death should compel veterinarians everywhere to pause, forthwith, and pay tribute to Dr. Brumley's achievements in giving momentum to the profession's upward march in recent years. These are outwardly expressed (but perhaps overlooked) by his unflagging devotion to such things as the integration of the AVMA and the state associations into a solid and workable unit, the framing of the basic laws for its operations,

revision of the organization setup, the reorganization of the central office, and rehabilitation and aggrandizement of the Association's publications. If these seem but commonplace matters of fact because of our nearness to them, they will be enthralling for the coming generations as the time when the veterinary profession was awakened to a new consciousness of its responsi-



Dr. Oscar V. Brumley

bilities and potential achievements. For these presents, Dr. Brumley generously shared credit with his team-mates. His retirement from the chairmanship of the Executive Board was deeply regretted as the office is one of great responsibilities which his successors will find easier to fulfill because of his conscientious attention to its duties.

In college work at The Ohio State University, Dr. Brumley was the successful dean, the popular teacher and author, the good disciplinarian, and a key figure in the affairs of the university faculty and on the campus, where he was so favorably known for nearly fifty years. As a public-spirited citizen, he was also well known and respected as a member of the Columbus Board of Health for a number of years, being president of the board in 1931. He was also a member of the Upper Arlington Board of Health, was active in humane work for several years, and had just been re-elected as president of the Columbus Humane Society the week before his death.

Born on a farm at Leipsic, Ohio, March 9, 1876, Dr. Brumley received his early education in the local high school and his degree in veterinary medicine from Ohio State in 1897. After postgraduate work at the Royal Veterinary College in Berlin, he returned to his alma mater to become a staff member in 1898. He was made assistant professor in 1902, an associate professor in 1904, and in 1910 was appointed full professor and director of veterinary clinics. In 1912, he was made secretary of the College of Veterinary Medicine, and was named to the deanship in 1929.

The highest honor of the profession was given to Dr. Brumley in 1937 when he was elected president of the American Veterinary Medical Association, having previously been a member of the Executive Board from 1930 to 1936. He was re-elected to the Executive Board in 1939 and was chairman for four of the five-year of the term, which was just completed at the annual meeting in 1944. Dr. Brumley also was president of the Ohio State Veterinary Medical Association in 1910-1912, and its secretary in 1920.

He was a member of the American Association for the Advancement of Science, the U. S. Live Stock Sanitary Association, Columbus Chamber of Commerce, Sigma Xi,

Phi Zeta, Omega Tau Sigma, Alpha Psi, Acacia, several Masonic orders, and the Faculty Club.

Surviving are his wife, Annabelle Tawney Brumley; three brothers, Henry of Aurora, Mo.; Daniel, Chicago, and Benjamin, McComb, Ohio; and four sisters, Mrs. Mary Denhart, Nardin, Mo.; Mrs. Addie Denhart, Toledo; Mrs. Minnie Stewart, McComb, and Miss Flo Brumley, Leipsic.

The New Graduate

It is indeed very, very doubtful that lack of experience of the new graduate is as much of a menace to the profession as some are wont to emphasize. Wouldn't it be better to admit that each new class of graduates brings more into the profession year by year than their still untrained fingers take out by what has been glibly called "lack of experience," in the presence of an ailing animal?

The neograduates are not morons. They are men who fortify the profession with advanced knowledge that the experienced practitioner is apt to (and frequently does) underrate. In the practice of medicine, experience has always been overtouted, for, unless backed by knowledge of the basic sciences embraced and also by a concurrent determination to keep consistently abreast of their advancement, experience is more detrimental than helpful, in the long run, in the application of a learned profession. The not-so-dumb self-made men who met the first waves of college graduates fought them on the ground of "lack of experience." In fact, Experience versus Knowledge is a lawsuit in American life that has never been settled. The experienced of today who frown on the new graduates are behaving in strictly normal fashion by inborn habit, unaware of the debt they owe them. In the march of veterinary medicine, experience, on the whole, has been a heavier-than-air obstacle compared with the bouyant knowledge each graduating class has brought in.

Sterilizing, dehydrating, canning, refrigerating, and freezing of food belong in the veterinary curriculum, granted that food inspection is veterinary service.

Dr. R. C. Klussendorf to Join Association Staff

The Board of Governors announces the appointment of Raymond C. Klussendorf, B.Sc.Ag., D.V.M. (Wis. '23 and Cornell '31), as Associate Editor and Assistant Executive Secretary, effective about April 1, 1945. The appointment was found necessary to meet the ever-increasing journalistic and organizational work of the Association.

Dr. Klussendorf was born in Milwaukee, Wis., June 6, 1898, and was graduated from the Milwaukee School of Agriculture in 1918, the College of Agriculture, University of Wisconsin, in 1923, and the New York State Veterinary College, Cornell University, in 1931. At Wisconsin he took his major in animal husbandry and his minor in journalism, graduating *cum laude*, and was a member of the varsity crew, Saddle and Sirloin Club, the Agricultural Literary Society, and the dairy-cattle and livestock judging teams. He served, in addition, as student assistant at the dairy barns for two years and at the stock pavilion for a year. He interrupted his student life for a year to engage in test-cow and show-herd work at the Edgemoor Guernsey Farms in California, and following graduation he was herd manager and later farm manager of the Jubilee Brown Swiss Farms at Peoria, Ill. For two years, 1925-1927, he took charge of test cows and show herds of Walhalla Brown Swiss Farms, Hammond, N. Y., and showed cattle for the Robertson Holstein-Friesian Farms, York, Pa., entering the New York State Veterinary College at the termination of that service in the fall of 1927. At Cornell, after his first semester, he worked in the diagnostic laboratory in addition to his other student activities. Noteworthy were his elections to several honorary societies at both Wisconsin and Cornell.

Dr. Klussendorf entered the veterinary field by affiliating with the distinguished dairy-cattle practice of Drs. M. W. Downing and Herbert Lothe at Waukesha, Wis., only, however, to be called three years later to take charge of the veterinary control laboratory at Madison for the State Department of Agriculture, a commission comprising diagnostic work, blood testing, and consultations with practitioners, which he filled for seven years. In June 1941, he

again entered private practice as an associate with Dr. J. J. Roberts at Columbus, Wis.—an important connection he leaves in



Dr. R. C. Klussendorf

April to enter upon his new duties. Readers of current literature need not be reminded of Dr. Klussendorf's contributions to conference and association programs on reproductive disorders and mastitis in dairy cattle and particularly on the diseases of calves, in recognition of which he was made chairman of the AVMA Special Committee on Diseases of Dairy Cattle.

Dr. Klussendorf brings to his new position an excellent background and experience in veterinary science and its application, and a keen appreciation of the practitioner's problems and the challenges which our official and private veterinary services must meet. Moreover, his training and ability in journalism are apt attributes for the editorial duties he will assume in collaboration with the present staff.

CURRENT LITERATURE

ABSTRACTS

Familial Factor in the Incidence of Bovine Mastitis

A six-year study was made of the prevalence of mastitis in a herd of 60 Guernsey cows, containing two families. The study comprised 235 complete lactation periods of 102 cows. The examination included the plating of 1 cc. of a 1 to 20 dilution of foremilk in 12 cc. of bovine-blood agar. Prescott and Breed's technique for leucocyte counting and Udall and Johnson's method of physical examination were used. One family, composed of the dam, 3 daughters, and 2 granddaughters, was found to be infected with streptococci during 24.0 per cent and with staphylococci during 39.3 per cent of their milking periods. The other family, composed of the dam, 4 daughters, and 2 granddaughters showed infection from streptococci during but 0.9 per cent and from staphylococci, 10.9 per cent of the milking period.—[James M. Murphy, K. O. Pfau, O. L. Lepard, and J. W. Bartlett: *Comparison of the Incidence of Udder Infection and Mastitis in Two Cow Families*. *Cornell Vet.*, 34, (July, 1944): 185-192.]

Collective Farming

Although in doubt as to its "workability" in Australia, the collective farming of more than 93.5 per cent of Russian land appears to be popular, judging from the unity of the co-operatives in the war effort. There are 243,000 collective farms in the U. S. S. R. at the present time. The process consists of pooling all livestock and implements of a given group of peasant farmers—like tenants of a landlord's estate. Members are provided with cows, pigs, and poultry for the personal use of the Republic. Income is governed by the number of work-day units with which they are credited, thus distinguishing between the ambitious and the lazy. A unit is the average amount of work a man can do in a day. Machine and tractor stations lie adjacent to the collective farms. Machinery is hired out on contract with the government. Remarkable results have been achieved on these farms and the members are given social facilities such as club houses, cinemas, schools, etc. The author points out that there had to be a revolution to acquire possession of the land. The old landlords were shot or deported. There is little similarity be-

tween the Russian peasant farmer and the Australian farmer. The climate, land, conditions, and people are so different.—[C. W. Jones: *Farming Conditions and Prospects after the War*. *J. Dept. Agric. South Australia*, 47, (July, 1944): 558-560.]

The Influence of Fluorides on Weight, Height, and Fractures

Reports that the intake of fluorides in animals affects skeletal development and general health could not be confirmed by investigations carried out by the United States Public Health Service, on 1,425 high school boys and 2,529 inductees, physically examined for the armed forces. The study was made from New England, where the domestic drinking water contains no fluorides, to Texas and Oklahoma where the fluorine concentration of drinking water is relatively high. The high incidence of dental caries where fluorides run low and of mottled enamel in children's teeth where the concentration of fluorine in the domestic drinking water is high was conceded. In regard to the effect on bone strength and skeletal performance, height, and weight, no relation was shown by exposure to low or high intake of fluorides.—[F. J. McClure, Senior Biochemist, U. S. Public Health Service. *Fluoride Domestic Water and Systemic Effects*. *Pub. Health Rep.*, 59, (Dec. 1, 1944): 1543-1556.]

Probable Vitamin E Deficiency in Young Ring-Necked Pheasants

A hitherto undescribed muscular dystrophy was observed in young ring-necked pheasants (*Phasianus c. torquatus*) while making pathologic examination to obtain information on Connecticut-bred pheasants prior to liberating them in the fall. The birds, 8 males and 41 females, varied from 8 to 18 weeks old, weighed from 250 to 880 Gm., all in good flesh and well developed, and had been fed eight different commercial brands of feed. Ten (20.4%) showed mild pathologic conditions of the crop, liver, and trachea, suggesting attacks of monilliasis, blackhead, and gapes, respectively. One had perosis. The pathologic examination revealed muscular dystrophy in 4 males and 14 females (36.7%), unaccompanied by recogniz-

able symptoms. Alterations present in the breast muscle and superficial flexors were characterized by whitish fibers alternating among the normal ones, and radiating fanlike from the sternal crest, in some instances showing irregular swollen areas. Striae, fish fleshlike, not sharply defined, were seen in the milder cases. The splanchnic organs showed no definite lesions.

Fowl paralysis, equine encephalomyelitis, and avitaminosis A were ruled out. Histologically, the changes were similar to those of Zenker's degeneration. The dystrophy was not a respecter of sex or age. As to cause, feeding experiments with rations low in vitamin E should be made. —[Erwin Jungherr, Rebecca Gifford, and A. L. Lamson: *Unapparent Muscular Dystrophy in Young Ring-Necked Pheasants. J. Wildlife Management*, 8, (July, 1944): 261-263.]

Effects of Artificial Light on Chicks

Chicks hatched during the hot summer months in California were checked for gains and feed consumed under (1) artificial light all night, (2) artificial light from midnight to morning, and (3) no artificial light. At the end of ten weeks in 1 experiment and twelve weeks in 5 other experiments, the chicks receiving light weighed more and had eaten less feed than those raised without artificial light. In 4 of the experiments, the cockerels were separated from the pullets at 12 weeks of age. Under artificial light from midnight to morning or all night, the pullets weighed more at 16, 20, and 24 weeks than those receiving no artificial light, with the ones exposed to artificial light all night weighing slightly less than the midnight-to-daylight group. Artificial light, however, had little effect on the average time the pullets began to lay, or upon the average weight of their first 10 eggs.—Burt W. Heywang: *The Effect of Artificial Light on Chicks Brooded during Hot Weather. Poultry Sci.*, 23, (Nov. 1944): 481-485.

Canine Danders Differ

It is well known in veterinary and human medicine that certain dog owners are allergic to the flair of dogs, but that the hypothetical allergen differs among canine breeds is a newly disclosed fact. For example, a person may be sensitive to the allergen of a Poodle and not to that of a Bulldog and *vice versa*. A limited number of such observations, confirmed by dermal tests, have been reported by physicians. A typical one was a severe attack of asthma suffered by the owner of a Bulldog two days after bringing home a French Poodle. The asthma ceased when the Poodle was removed

and returned mildly after its new keeper paid the victim a visit, minus the allergenic Poodle. The dermal test with pooled canine hair was negative, whereas, the reaction from a French Poodle excitant was pronounced.

Another case is that of a woman in Rhode Island who was seized with an attack of asthma every time her constable husband brought in a Spitz, although she was not sensitive to other breeds.

The author attempts to simplify the problem by presuming that there are not as many allergens as there are breeds but that all dogs in this respect belong to either one of four groups based upon prehistoric origin, namely: *Canis palustris*, *Canis pallipes*, *Canis simensis*, and *Canis molossus*, each of which has its descendant breeds.

Although this research is admittedly incomplete, it may be the basis for the further study of the allergenic dog.—[Stanford B. Hooker, M.D., F.A.C.A.: *Qualitative Differences among Canine Danders. Allergy*, 2, (July-Aug. 1944): 281-288.]

Flake Lye for Preserving Milking Machine Inflatons

Not only for the duration of the rubber shortage but always, treating milking machine inflations in hot lye solution is recommended as a method of prolonging the life of the teat cups of milking machines. Considerable fat is worked into the substance of the rubber at its point of contact with the teat from the milk that finds its way into that area. It was astonishing to note the amount of butterfat soap removed from the inflations when treated with hot lye solution. One set of cups alone yielded 3 oz. Besides, the treatment restored elasticity to the cups and rendered them usable longer than new ones.

The inflations are immersed in lye solution (2 heaping teaspoonfuls to the quart of water), kept just below boiling point, for three to five hours. Hard water is softened with baking soda. To prevent scorching the inflations, wire is placed either beneath the vessel or within. Complete immersion throughout the heating is essential. Rinsing and brushing finishes the treatment. The caustic action of lye is kept in mind in handling the solution.—[C. K. Johns: *Longer Life for Milking Machine Inflatons, Ottawa, Ont., The DeLaval Monthly*.]

Artificial Insemination of Bees.—The department of economic entomology of the state agricultural college in cooperation with the U. S. Department of Agriculture is conducting experiments in Wisconsin on the artificial insemination of queen bees with the object of improving honey production and resistance to foul brood.

BOOKS AND REPORTS

Controlling Hog Diseases

A luxurious booklet published under this title for the edification of swine breeders condenses the basic facts related to the subject into a few well-chosen words and pictures. It presents prominent men's conceptions of hog diseases, men of—let us say—extraordinary experience who know what to hammer home in directing the large-scale swine production of the American Cornbelt. The Live Stock Sanitary Committee of Iowa is composed of upper bracket figures from the livestock industry: packers, stockyards, livestock exchanges, farm organizations, serum companies, and bankers, who measure the value of animal health with much greater wisdom than was ever shown by the owners themselves. The broad viewpoint of an important matter concisely told symbolizes more hope for the future of veterinary medicine than veterinarians have realized. Twenty subjects covering the constructive and destructive agencies facing the livestock industry are treated with understanding and intelligence that would do credit to the foremost veterinary authors. Get a copy and write the Committee whether or not you like it.—[*Controlling Hog Diseases*. Edited by Harry J. Boyts, *Live Stock Commissioner, Sioux City, Iowa*. 20 pages. Classical illustrations. 1945.]

Biotin: Annotated Bibliography—1944

This is a bound brochure of 104 pages of off-set printing, divided into seven chapters of classified abstracted material: Chemical, Investigation, and Description; Occurrence; Physiological Activity; Clinical Uses; Method of Assay; Reviews; and Index of Authors. The text is a revision of the 1942 edition.—Published by Merck & Co., Rahway, N. J.

Penicillin

Penicillin, compiled by the staff of the Abbott Laboratories, is the second brochure of the same name published by commercial firms in recent months. It is a review of the present knowledge about that "wonder drug," containing sketches of its discovery; its microbicide action; its clinical uses alone and in combination with sulfonamides, and other antibiotics; its production, purification, and physical properties; its administration and dosage; and an extensive bibliography which serves well for keeping one informed on a subject of current significance.—[*Penicillin*. By the Staff of the Abbott Research Laboratories, 112 pages. Paper. Illustrated. The Abbott Laboratories, North Chicago, Ill. 1944.]

The Horse America Made

To be suddenly reminded that we do have an exclusively homemade breed of horse is a thrill, for, unlike mechanical contraptions, breeds are not made in a day and our country is young. To evolve a grouping of animals that stands out from the crowd as a breed requires generations and a lot of painstaking effort, inspired by inborn devotion to the cause. The development of a type of domestic animal conforming to a uniform size, profile, performance, temperament, behavior, and function, and totally removed from atavistic diatheses is an achievement of an equally long lineage of devotees, in this case, of gentlemen ahorseback who enchanted the bridlepath and show ring with a thing of grace and elegance, now set apart as a breed of horse, unchallenged—a breed, moreover, that weathered the onrush of the automobile not only unhurt but thrifty. While other horse-breeding societies sank or folded up, the saddle-horse breeder's rose to loftier heights. The American Saddle Horse Breeders Association was founded in 1891, and contrary to what might have been expected during the following decades, it (quoting) "survived the lean years in very healthy condition and instead of relaxing the stringency of registration requirements, steadily increased it."

Obviously, unhorsing Americans was never in the cards. And, another thing, in dredging the genealogy of American horses, one is promptly taken overseas. The proud Thoroughbred and its light-harness cousins—the trotter and pacer—the Hunters and Hackneys, and the work-horse breeds are of foreign parentage. The American Saddle Horse is the unique exception, as much so as the Boston Terrier, for here is a breed of horse that *was* made in America as the title of this book divulges. Whence? From the early mounts of the New England hills and the farms of Virginia, and later from the estates of Kentucky, Tennessee, and Missouri, where devoted equiphiles bred and rebred, selected and discarded, until the graceful mount of the park and horse show became as distinctive as the Thoroughbred and Standardbred of racing fame, and independent of their blood lines. The American riding horse entitled to registration as such is a descendant of colonial horses that were here a century before the Thoroughbred came over from England and created the light-harness horse.

But, beyond this interesting history of origin are profusely illustrated directives on the training, riding, and raising of saddle horses, show horses and horse shows, the care and use of riding horses for work and sport and play, first aid to the injured with good advice on meddling with colic, bad wounds, and "azote urea."—[*The Horse America Made*. By Louis Taylor. 243 pages. Illustrated. Cloth. American Saddle Horse Breeders Association, Louisville, Ky. 1944. Price \$2.50.]

THE NEWS

Government Ban on Conventions Affects Veterinary Meetings

The cancellation of veterinary meetings, short courses, and conferences, including the 1945 annual sessions of some state veterinary associations and the AVMA, became a possibility on January 11 when it was announced that Director of War Mobilization and Reconversion, James F. Byrnes, with approval of the President, had set up a War Committee on Conventions for the purpose of effecting a cessation of group meetings to be attended by more than 50 persons. Organizations planning to hold conventions, conferences, trade shows or meetings after Feb. 1, 1945 "will have to show how the war effort would suffer if the meetings were not held," according to Col. J. Monroe Johnson, chairman of the committee.

The announced objectives of the move are "to relieve overburdened transportation and hotel facilities and conserve desperately needed scarce materials and manpower." Special permits will be required to hold meetings of more than 50 persons and this applies to industrial, business, labor, fraternal, professional, religious, civic, social, and governmental organizations, according to the official announcement of the decisions reached by the War Committee on Conventions.

Applications for permits must be sent to the secretary of the committee, Richard H. Clare, Room 7321, Interstate Commerce Commission Bldg., Washington 25, D. C. and should be filed at least thirty days prior to the proposed date of the meeting, but not more than six months in advance. Application forms may be obtained from regional and district offices of the Office of Defense Transportation, at most hotels and convention bureaus, and from the national ODT office in Washington, D. C. Information required by the committee includes:

"Whether the planned meeting is a convention, conference, trade show, or government meeting; the date and location of the proposed meeting and name of hotels or other facilities that will be used; attendance planned; previous frequency of meetings; location and attendance of last previous meeting; average attendance at similar meetings before the war and during the war; from what area those attending are drawn; what steps have already been taken to curtail attendance; why the objectives of the meeting cannot be attained through

'Conventions by Mail'; why a group of 50 or less to whom powers are delegated cannot transact the necessary affairs of the organization and in what way and to what extent the war effort would suffer if meeting were not held."

A number of national and state organizations of various kinds have already announced indefinite postponement or outright cancellation of their meeting plans for 1945. Included in these is the American Medical Association which was scheduled to meet in Philadelphia next June.

Announcement regarding this year's meeting of the AVMA (tentatively scheduled for Chicago, August 21-24) will probably be published in the March JOURNAL.

Up to press time, the AVMA office had been advised of the following changes in veterinary meeting plans (*see*, also, "Coming Meetings", p. 132).

Change of Dates—New Jersey Veterinary Medical Association met in Newark on Jan. 30-31 instead of Feb. 1-2.

Cancelled or Indefinitely Postponed—Texas Veterinary Medical Association; Nebraska Veterinary Medical Association; Alabama Short Course for Veterinarians; Colorado Conference for Veterinarians; AAHA annual spring meeting.

Changes in Committee Appointments

President James Farquharson has made the following changes in the committee appointments which were published in the Official Roster for 1944-45 (*see* JOURNAL for October, 1944, pp. 266-272):

Special Committee on History—Dr. W. E. Cotton, Alabama Polytechnic Institute, Auburn, Ala., replaces Dr. D. H. Udall. Dr. Cotton will also serve as chairman.

Special Committee on Nomenclature of Diseases—Dr. Carl Olson, Jr., Massachusetts State College, Amherst, Mass., replaces Dr. Wm. H. Feldman. Also, Dr. I. A. Merchant, Iowa State College, Ames, Iowa, is added as a member of this committee.

Special Committee on Milk Hygiene—Dr. H. J. Kroger, St. Louis, Mo., is transferred to this committee from the Special Committee on Food Hygiene.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

BEDDOW, RALPH N.

3228 Esther St., Honolulu 40, Hawaii.

D.V.M., Washington State College, 1944.

Vouchers: L. C. Moss and J. M. Hendershot.

BENNETT, J. E.

2930 Cambie St., Vancouver, B. C., Can.

B.V.Sc., Ontario Veterinary College, 1911.

Vouchers: F. W. B. Smith and J. G. Jervis.

BRAVO, TORCUATO M.

Casilla 537, Santiago, Chile.

M.V., Escuela de Medicina Veterinaria, Chile, 1943.

Vouchers: J. San Miguel and O. Bastias.

DAVIS, R. H.

Post Road, Stamford, Conn.

D.V.S., New York-American Veterinary College, 1905.

Vouchers: J. B. Skelton and C. E. Flaxman.

DIAZ, RICARDO E.

Casilla 537, Santiago, Chile.

M.V., Escuela de Medicina Veterinaria, Chile, 1943.

Vouchers: J. San Miguel and O. Bastias.

DOUGLASS, F. J. JR.

1615 Metairie Rd., New Orleans 20, La.

D.V.M., Texas A. & M. College, 1944.

Vouchers: F. J. Douglass and E. P. Flower.

DRUDGE, J. H.

Assistant Station Veterinarian, Camp Gordon Johnston, Fla.

D.V.M., Michigan State College, 1943.

Vouchers: J. Henry Ricker and G. E. Keith.

ESTLER, L. E.

855 Passaic Ave., Arlington, N. J.

B.V.Sc., Ontario Veterinary College, 1936.

Vouchers: D. E. Bartlett and W. J. Foster.

FARBER, SHELDON S.

3235 W. Columbia Ave., Philadelphia 21, Pa.

V.M.D., University of Pennsylvania, 1944.

Vouchers: D. DeCamp and M. A. Jaffe.

FOSS, WILLIAM D.

518 S. Minnesota St., Prairie du Chien, Wis.

D.V.M., Kansas State College, 1923.

Vouchers: J. S. Healy and W. R. Winner.

FUENZALIDA, EDUARDO

Casilla 773, Santiago, Chile.

M.V., Escuela de Medicina Veterinaria, 1935.

Vouchers: J. San Miguel and O. Bastias.

KASKIN, SAMUEL T.

108 Essex St., Bangor, Maine.

V.M.D., University of Pennsylvania, 1942.

Vouchers: J. D. Beck and F. G. Sperling.

KLAUSMAN, BERNARD S.

7713 37th Ave., Jackson Heights, L. I., N. Y.

V.M.D., University of Pennsylvania, 1935.

Vouchers: R. Berens and A. A. Livingston.

LEGROW, W. R.

321 Dryden Road, Ithaca, N. Y.

B.V.Sc., Ontario Veterinary College, 1941.

Vouchers: H. L. Gilman and R. R. Birch.

MOTT, RICHARD E.

385 S. Sierra Madre Ave., Pasadena, Calif.

D.V.M., Iowa State College, 1944.

Vouchers: C. T. Lambert and A. R. Inman.

SALL, MORTON L.

416 E. Jefferson St., Sandusky, Ohio.

D.V.M., Texas A. & M. College, 1940.

Vouchers: J. H. Adams and M. J. Hatter.

THOMPSON, K. H.

Milner, B. C., Can.

B.V.Sc., Ontario Veterinary College, 1931.

Vouchers: J. G. Jervis and F. W. B. Smith.

Second Listing

Barry, Francis A., Station Hosp., Camp Upton, N. Y.

Campbell, A. R., Hensall, Ont., Can.

Chen, C. C., c/o Chinese Embassy, Washington, D. C.

Gissendanner, A. R., Box 623, Dothan, Ala.

Hickman, H. B., Malta Bend, Mo.

Jacobs, Leonard D., 1312 W. 15th St., Sioux City 17, Iowa.

Lint, G. M., 6631 S. California Ave., Chicago, Ill.

Stiern, Richard, 1012½ N. Sultana, San Gabriel, Calif.

Thompson, A. W., 118 S. Minnesota St., Prairie du Chien, Wis.

Tinsman, R. E., 148 Monhagen Ave., Middletown, N. Y.

1945 Graduate Applicants

First Listing

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Colorado State College*

ANDERSON, JAMES E., D.V.M.

800 N. Orlando, Los Angeles, Calif.

Vouchers: J. Farquharson and R. F. Bourne.

AUSHERMAN, LEWIS T., D.V.M.

Miami, N. Mex.

Vouchers: M. K. Jarvis and K. W. Smith.

BARNGROVER, WALTER J., D.V.M.

Hugo, Colo.

Vouchers: J. Farquharson and K. W. Smith.

- BROWN, ALFRED G., D.V.M.
c/o Ted R. Ryan, Rocky Ford, Colo.
Vouchers: C. P. Zepp, Jr., and M. K. Jarvis.
- BROWN, WILLIAM W. JR., D.V.M.
Box 445, Sterling, Colo.
Vouchers: M. K. Jarvis and V. D. Stauffer.
- BURCH, JOE E., D.V.M.
Box 701, Tulia, Texas.
Vouchers: J. Farquharson and V. D. Stauffer.
- CARRICABURU, JOHN B., D.V.M.
Box 123, Los Olivos, Calif.
Vouchers: J. Farquharson and K. W. Smith.
- CHAPIN, JOHN A., D.V.M.
Rt. No. 1, West Plains, Mo.
Vouchers: K. W. Smith and M. K. Jarvis.
- CLARK, R. MOSS, D.V.M.
1507 17th St., Santa Monica, Calif.
Vouchers: C. P. Zepp, Jr. and M. K. Jarvis.
- CONSIGLIERI, A. EULOGIO, D.V.M.
c/o Peruvian Embassy, Washington, D. C.
Vouchers: J. Farquharson and K. W. Smith.
- CRANE, CHARLES S., D.V.M.
1612 N. Lake Ave., Pasadena, Calif.
Vouchers: J. Farquharson and K. W. Smith.
- EMERY, REX W., D.V.M.
2306 Avenue E, Scottsbluff, Neb.
Vouchers: J. Farquharson and K. W. Smith.
- EYL, NORMAN W., D.V.M.
624 S. Loomis, Fort Collins, Colo.
Vouchers: J. Farquharson and K. W. Smith.
- FRANDSON, ROWEN D., D.V.M.
R. R. No. 2, Box 221, Loveland, Colo.
Vouchers: M. K. Jarvis and K. W. Smith.
- GARVIK, KENNETH E., D.V.M.
Box 684, Sterling, Colo.
Vouchers: J. Farquharson and K. W. Smith.
- GOETZ, ELMER F., D.V.M.
317 S. 18th St., Mattoon, Ill.
Vouchers: J. Farquharson and R. F. Bourne.
- GRUETER, HERMAN P., D.V.M.
Rt. No. 3, Elk City, Okla.
Vouchers: J. Farquharson and M. K. Jarvis.
- HAUSE, ROBERT D., D.V.M.
Rt. No. 2, Box 57, Fort Lupton, Colo.
Vouchers: K. W. Smith and V. D. Stauffer.
- HODLEY, R. E., D.V.M.
507 Sergeant St., Joplin, Mo.
Vouchers: J. Farquharson and K. W. Smith.
- HOWARTH, JACK A., D.V.M.
Eaton, Colo.
Vouchers: J. Farquharson and K. W. Smith.
- HUFFAKER, ROBERT H., D.V.M.
Rt. No. 1, Alamosa, Colo.
Vouchers: J. Farquharson and K. W. Smith.
- JESSEN, LOTHARD T., D.V.M.
Danneborg, Neb.
Vouchers: J. Farquharson and M. K. Jarvis.
- JOHNSON, WENDELL L., D.V.M.
1112 M St., Modesto, Calif.
Vouchers: J. Farquharson and K. W. Smith.
- KETTLE, BENJAMIN W., D.V.M.
Westcliffe, Colo.
Vouchers: J. Farquharson and V. D. Stauffer.
- LINNELL, MARVIN R., D.V.M.
905 Patterson St., Glendale, Calif.
Vouchers: K. W. Smith and M. K. Jarvis.
- LYVERE, DONALD B., D.V.M.
1675 S. Corona, Denver, Colo.
Vouchers: R. F. Minnick and K. W. Smith.
- MCCHESNEY, THOMAS S., D.V.M.
708 Remington St., Fort Collins, Colo.
Vouchers: A. W. Deem and R. Jensen.
- MCINTYRE, RANKIN W., D.V.M.
8027 Teasdale Ave., University City, Mo.
Vouchers: K. W. Smith and J. Farquharson.
- MAEDA, CHESTER, D.V.M.
3406 S. Figueroa, Los Angeles, Calif.
Vouchers: J. Farquharson and K. W. Smith.
- MAHNKEN, KEITH W., D.V.M.
105 E. 5th St., Holden, Mo.
Vouchers: K. W. Smith and J. Farquharson.
- MILLER, LESLIE D., D.V.M.
1347 Garfield St., Denver 6, Colo.
Vouchers: R. F. Bourne and A. W. Deem.
- MITCHELL, H. B., D.V.M.
1801 S. College, Fort Collins, Colo.
Vouchers: K. W. Smith and J. Farquharson.
- NEURAUER, LLOYD J., D.V.M.
Box 444, Eaton, Colo.
Vouchers: J. Farquharson and K. W. Smith.
- ORSBORN, J. S. JR., D.V.M.
Rt. No. 1, Box 455, Fullerton, Calif.
Vouchers: M. K. Jarvis and A. W. Deem.
- ORSBORN, RUTH A., D.V.M.
1055 Green St., San Francisco 11, Calif.
Vouchers: K. W. Smith and J. Farquharson.
- PHILLIPSON, DAVID A., D.V.M.
Holbrook, Neb.
Vouchers: J. Farquharson and M. K. Jarvis.
- ROBERTS, NORMAN C., D.V.M.
5024 Hastings Road, San Diego, Calif.
Vouchers: J. Farquharson and K. W. Smith.
- SCHNEIDER, WARREN J., D.V.M.
Rt. No. 1, Box 158, Crows Landing, Calif.
Vouchers: J. Farquharson and K. W. Smith.
- SHOFFNER, C. CLINTON, D.V.M.
406 Pitkin St., Fort Collins, Colo.
Vouchers: M. K. Jarvis and C. P. Zepp, Jr.
- STROHAUER, DAVID M., D.V.M.
Rt. No. 1, Box B, LaSalle, Colo.
Vouchers: J. Farquharson and V. D. Stauffer.
- VON GOERTZ, ROLFE A., D.V.M.
Elmore, Minn.
Vouchers: K. W. Smith and R. Jensen.
- WALKER, DONALD F., D.V.M.
R. R. No. 1, Platteville, Colo.
Vouchers: C. P. Zepp, Jr. and M. K. Jarvis.

Texas A. & M. College

- MYATT, BARNEY A., D.V.M.
3312 Leeland, Houston, Texas.
Vouchers: F. P. Jaggi, Jr. and A. A. Lenert.

Second Listing Cornell University

- Santivanez, Jose, D.V.M., 301 Bryant Ave.,
Ithaca, N. Y.

Michigan State College

Bush, Charles T., D.V.M., 979 39th St., West Palm Beach, Fla.

Miller, Paul T., D.V.M., Rt. No. 2, Box 105, Olivet, Mich.

Mootz, Charles E. Jr., D.V.M., 215 S. Rusk, Viroqua, Wis.

Siegmund, O. H., D.V.M., 215 S. Rusk, Viroqua, Wis.

COMMENCEMENTS

Colorado State College

The commencement exercises of Colorado State College were held on Dec. 22, 1944. The following men were graduated with the degree of Doctor of Veterinary Medicine:

- | | |
|-----------------------|-----------------------|
| *Anderson, James E. | *Johnson, Wendell L. |
| *Ausherman, Lewis T. | Kettle, Benjamin W. |
| Barngrover, W. J. | Linnell, Marvin R. |
| Brown, A. Gordon | LyVere, Donald B. |
| *Brown, W. W., Jr. | McChesney, T. S. |
| Burch, Joe E. | McIntyre, Rankin W. |
| *Carricaburu, John B. | Maeda, Chester A. |
| *Chapin, John A. | *Mahnken, Keith W. |
| Clark, Richard Moss | *Miller, Leslie D. |
| Crane, Charles S. | Mitchell, Harry B. |
| *Emery, Rex W. | *Neurauter, Lloyd J. |
| *Eyl, Norman W. | *Orsborn, J. S., Jr. |
| *Frandsen, Rowen D. | Orsborn, Ruth A. |
| Garvik, Kenneth E. | *Phillipson, David A. |
| Goetz, Elmer F. | *Roberts, Norman C. |
| *Grueter, H. Parnell | *Schneider, Warren J. |
| *Hause, Robert D. | Shoffner, C. Clinton |
| *Hoadley, Richard E. | Strohauer, David M. |
| Howarth, Jack A. | Von Goertz, Rolfe A. |
| *Huffaker, Robert H. | Walker, Donald F. |
| *Jessen, Lothard T. | |

The asterisk before the name indicates those who were commissioned as first lieutenants in the Veterinary Corps of the United States Army.

U. S. GOVERNMENT

Brucellosis Campaign.—The progress made in the control of bovine brucellosis, since the use of strain 19 vaccine was approved in 1940, was reviewed by Chief A. W. Miller of the U. S. Bureau of Animal Industry at the annual meeting of the U. S. Live Stock Sanitary Association held in Chicago in December. The advantages and disadvantages were determined by extensive field use of the vaccine since 1936 when 179 herds were chosen for making the tests. Of these, 171 herds remain under the vaccine treatment and the owners are pleased

with the results. Close coöperation with state officials was recommended. In the case of light infections of long standing, the test-and-slaughter plan is preferable. Through the removal of more than 2,000,000 reactors, the incidence of the disease was reduced 50 per cent. No one fixed plan is as useful as selected plans; namely, (1) test-and-slaughter, (2) test-and-slaughter with strain 19 vaccination, and (3) testing-and-retention of reactors with calfhood vaccination. The Bureau's objective is the eradication of brucellosis from the cattle population. To accomplish this, all three plans will be employed.

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Medical History of World War II.—At a meeting of army historians, held at the office of the Surgeon General, Dec. 6, 1944, it was announced that the medical history of the present war would be complete within six months after the cessation of hostilities. It required twenty-three years to complete the medical history of the War between the States and ten years for that of World War I. Historians of leading universities have been commissioned in the Medical Administrative Corps for that purpose. The series of volumes promise to be the most complete and revealing account of military medicine ever compiled.

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Atabrine Released.—Atabrine (= quinacrine) succedaneum for quinine and other cinchona alkaloids employed in the treatment of malaria has been released for civilian use by the War Production Board. A lessened demand for military use is announced.

• • •

Outlines Veterinary Corps Duties.—In an article in the *New York Times*, Nov. 26, 1944, Maj. Gen. Norman T. Kirk, Surgeon General of the Army, outlines the duties of the Veterinary Corps as follows: "The Veterinary Corps, besides its responsibility for the health of all Army animals, has the additional task of protecting troops against contaminated meat and dairy products. Most recent reports indicate that veterinary officers are daily inspecting more than 21,000,000 lb. of such food supplies in this country. Rejection rates, according to these reports, average slightly more than 3 per cent. By rejection of food supplies which do not come up to standard, veterinarians not only safeguard the lives of soldiers but protect the Government's general interest by requiring that contract specifications be adhered to."

The article entitled "School of Battle for Doctors," appeared in the magazine section. It is a well-illustrated brief on the operations of the Medical Department, broaching the war as a vast clinic which will have a far-reaching effect on the postwar advancement of medicine.

AMONG THE STATES

Alberta

Typhoid Fever from Cheese.—Of 507 cases of typhoid fever in the province (pop. 788,393) from 1936 to the last half of 1944, 111 of them in three outbreaks—1936, 1938, 1944—were traced to the consumption of infected cheddar cheese (*Canad. J. Pub. Health*, Nov. 1944). The outbreak of 1944 was the most widespread. It accounted for 83 of the total 111 cases and for 7 deaths. The area 300 miles long and 100 miles deep in the southern part of the province was involved. The eating of "green" cheddar cheese was incriminated but only on circumstantial evidence, since the specific agent could not be isolated from any of the cheese samples examined. The epidemics led to the passing of a law requiring that all cheese sold in the province must either be made from pasteurized milk or ripened for three months following manufacture. The preventive measures correspond to those for cheese-borne outbreaks in Ontario, Quebec, and Manitoba.

California

Wild Dogs.—A pack of more than 80 feral dogs, said to be abandoned mascots of troops trained in that area, were rounded up in November, by deputy sheriffs in Alameda County on complaint of ranchers that their cattle and sheep were being killed. Forty dogs were killed, says the *San Francisco News*, as quoted by the *California Wool Grower*.

Liver Flukes.—Due to severe losses suffered from liver flukes in California and other states, the Board of Directors, California Wool Growers Association, has urged the U. S. Bureau of Animal Industry to appoint a parasitologist charged with the specific function of conducting research in the life cycle of the liver fluke with particular attention to the eradication of the intermediary host (the snail). A survey of the fluke situation in Mendocino County was suggested.

Wanted, New Dog Laws.—At a conference of ranchers and scientists held at the Agricultural College, University of California, Davis, in November, revision of the statutes pertaining to dogs was urged, the contention being that it was a mistake to place the administration of dog laws under the Health Code instead of the Agricultural Code. The stray dog primarily concerns the agricultural rather than the health services. The stray dog should be handled the same way as predatory animals, the ranchers contend.

Personal.—Joseph L. Geierman, Richfield, Utah, has bought the dog and cat hospital of W. C. Bateman, San Bernardino, Calif.

Colorado

Insect Fighter of CSC.—Colorado State College has won the distinction of having provided one of the most valuable men of World War II, Entomologist Fred C. Bishopp, of the USDA, who developed a method (still a military secret) of mastering disease-bearing insects and thus saving thousands of American lives. Dr. Bishopp, a native of Colorado, was graduated at Colorado State College before entering the government service. He has traveled more than 25,000 miles in the tropics in the pursuit of his work. As the story is told, entomologists land on the jungle islands with the first wave of troops to handle enemies more deadly than the Japs.

Personal.—Harry S. Burkhardt (Colo., '42) of Brighton, Colo., formerly employed on artificial insemination work in Wisconsin, is now an ensign in the U. S. Navy. After receiving "boot-training" at Camp Farragut, Dr. Burkhardt was sent to the University of Arizona for further training and was there commissioned an ensign in the Naval Reserve. At present, Ensign Burkhardt is Assistant Navigation and Communications Officer and Ship's Secretary aboard the USS Mazama, c/o F.P.O., San Francisco, Calif., "somewhere in the Pacific."

Delaware

State Association.—Thirty-three members and guests attended the annual meeting of the Delaware Veterinary Medical Association held at Kent Manor Inn, Wilmington, Dec. 14, 1944. The officers elected were Harvey Fell, Wilmington, *president*; V. C. Lancaster, New Castle, *secretary-treasurer*; William E. Spence, Milford; Harry McDaniel, Dover; and C. C. Palmer, Newark, *directors*. H. P. Eves (U.P. '87) was elected president emeritus for life. F. E. Martin, West Chester, Pa.; J. V. McCahon, Downingtown, Pa.; and V. C. Lancaster, in charge of the mastitis control program in Delaware, discussed bovine mastitis.

s/C. C. PALMER *Resident Secretary*.

Florida

The Pioneer Cattle State.—Cattlemen claim that better cattle could be raised in Florida, and why not? American history shows that it was the birthplace of our cattle industry. Ponce de Leon brought cattle to the mainland from Cuba in 1520 and DeSoto in 1539. The Seminole Indians—the first American cattlemen—were successful cattle raisers, *vide the writings*

of William Bartram (1765-1766) who saw (quoting) "innumerable droves of cattle; the lordly bull, the lowing cow, and sleek capricious heifer," from which the Indians, ahorseback, selected "the best steers to be slaughtered for a general feast in compliment of our arrival." In later years, these droves were overtaken with tick fever, poor pastures, "salt sickness" (= iron, copper, and cobalt deficiency), other nutritional diseases, inbreeding, and faulty herd management. Yet, the early settlers accumulated herds of cattle, mainly along the St. Johns River between Gainesville and Fort Meyers. During the War between the States, many Florida cattle were shipped to Cuba. In the 1870's and 1880's, Florida exported more cattle than Texas.

Development of the cattle industry, however, was slow owing to tick fever, "salt sickness," and worm parasites. Tick eradication, begun in 1923, was not completed until 1944 because of an interruption at the Indian Reservation in Collier County where a different strain of tick was found to be infecting deer.

With tick fever out of the way and the mineral-deficiency problems solved, the potentiality of Florida as a cattle state is immense, since it has a pasture area of approximately 29,682,997 acres, a farm-land area of 8,337,708 acres, and a rainfall of 56 inches annually.—*Excerpts from Economic Leaflets, University of Florida.*

Illinois

Department of Agriculture Veterinarians' Meeting.—The veterinarians employed by the State Department of Agriculture, Director Howard Leonard presiding, held their annual meeting and "get together" banquet at the Leland Hotel, Springfield, Jan. 17, 1945. The main subjects discussed were bovine and porcine brucellosis, tuberculosis in problem herds, statistics and trends in disease control activities. Names on the program were Lyons, Logan, Kuttler, Graham, Fox, Fiddler, Alcorn, VanCleave, and Jensen. Hon. John W. Kapp, Mayor of Springfield; Dr. R. A. Hendershott, chief of the Bureau of Animal Industry, Trenton, N. J., was guest speaker at the banquet.

State Association.—The sixty-third annual meeting of the Illinois State Veterinary Medical Association was held at the Leland Hotel, January 18-19, President L. A. Gray in the chair. The guest speakers were James Farquharson, Colorado State College, president of the American Veterinary Medical Association; J. D. Ray, pathologist, Corn States Serum Company, Omaha, Nebr.; F. X. Gassner, associate pathologist, Division of Veterinary Medicine, Colorado State College; Wayne H. Riser, Practitioner, Des Moines, Iowa; R. A. Hendershott, chief, Bureau of Animal Industry, Trenton, N. J.; W. F. Guard, Professor of Surgery, College of Veterinary Medicine, Ohio State

University; Lyman Peck, Nutrition Committee, American Feed Manufacturers' Association, Fort Wayne, Indiana.

The subjects and reporters (in parentheses) were: Address (Fidler), Surgical Procedures (Farquharson), Mastitis (Hendershott), Bovine Surgery (Guard), Feeding Beef Cattle and Swine (Peck), Small Animal Practice (Riser), Brucellosis (Jones, F. C.), Heart Worm in Dogs (Meginnis), Swine Erysipelas (Collins, C. R.), Baby Pig Diseases (Sampson), Bovine Mastitis (Daugherty), Poultry Parasites and Disease (Beard), Rabies (Ruggles), Nutrition (Hastings). Diseases of Swine (Ray, Schafer, Alcorn, Carter, Darst).

The attendance was more than 400. The officers elected were: J. V. Lacroix, Evanston, *president*; L. A. Dykstra, Aurora, *vice-president*; C. R. Collins, Dixon, member of the Executive Board.

The not-hard-to-take distraction, planned, fabricated, and bossed by W. B. Holmes, tycoon of after-eating fandango, measured up to the usual specifications.

Illinois Health Messenger.—The state Department of Health, Dr. Roland A. Gross, director, publishes a monthly message of public health containing material useful in veterinary medicine. The veterinarians of the state should ask to be placed on the mailing list. Its treatment of the moot question of animal experimentation in the December issue has the modest ring of convincing arguments in favor of the use of animal experimentation for the advancement of medicine.

K-9 Hero.—"King," war dog of Evanston, died in the service of his country. The letter announcing "King's" death said: "His conduct was such as to bring credit both to himself and to you as his owner." This canine hero was donated to the K-9 Corps by Mrs. Sophia Rushkewicz, of 1006 Ridge Avenue, mother of Pfc. George P. Rushkewicz, 26, on duty in Europe, and Lt. Raymond J. Rushewicz, 29, stationed at Fort Lewis, Wash. "King" was donated to the Army in 1942, at the age of 4 years, when he grieved over the absence of the boys.

Compliment from Page.—Arthur Page, distinguished commentator on the agricultural situation for WLS, paid a fine compliment to the veterinary profession the other day (Jan. 8), in pointing out the benefits the American people have derived from bovine tuberculosis eradication.

Iowa

East Iowa Veterinary Association, Inc.—At the executive board meeting, held Jan. 11, 1945, it was decided to hold the 32nd annual meeting of the association at Cedar Rapids,

Oct. 9-10, if practicable. The 1945 Policy and Advisory Committees will be named at a later date.

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East Central Iowa Veterinary Medical Society.—A dinner meeting was held at the Hotel Montrose, Cedar Rapids, Jan. 11, 1945. Thirty veterinarians from surrounding counties heard the following program:

V. M. Rinehart, Norway: "Colics in the Horse."

C. H. Banks, Tipton: "Necrotic Vulvitis in the Heifer."

H. N. Strader, Marion: "Shipping Fever in Cattle and Its Prevention."

Frank M. Wilson, Mechanicsville: "Shipping Fever in Cattle" (case reports).

Lieut. L. A. Bowstead, DeWitt: "Wood Tick Infestation in Cattle in Iowa." "Sand Colics in Army Horses."

Warren E. Bowstead, Lowden: "Respiratory Diseases of Fowl."

Joe W. Giffey, Cedar Rapids, conducted a question box on swine diseases.

Kansas

Encephalomyelitis.—There were 1,060 cases of equine sleeping sickness reported in the state during August and September (1944) with 192 deaths. In 1942, the number of cases was 132 with 30 deaths and in 1943, 79 cases with 25 deaths. The increase was attributed to less vaccination.

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Milk Sanitarians.—The state college gave a two-day course for milk sanitarians in November. Among the students were several veterinarians who serve their towns in that rôle. Secretary Bower of the state veterinary medical association spoke on the importance of veterinarians participating in this and other health measures in which animals are concerned.

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Slugged.—Sam Hayes, Hutchinson veterinarian, was slugged by an inmate of the State Reformatory while treating a cow at the Reformatory farm. The slugger, who absconded with the doctor's car, was captured several days later but Hayes "served time" in the hospital.

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Human Case of Rabies.—Death from rabies contracted from the bite of a dog and despite antirabic treatment was the fate of Miss Gertrude Baker of Burlington, who was bitten by her farm dog November 13 and died at an Emporia hospital December 15, after five days of illness. According to *Bulletin of the Kansas Veterinary Medical Association*, the sequence of dates as interpreted from the report was: Bitten and immediately taken to an Emporia hospital, November 13; Negri bodies found

present, November 18, i.e., after five days of observation; discharged from the hospital, November 30, or seventeen days after the bite; developed symptoms of rabies, December 10; and died December 15. The report is not clear as to when the antirabic treatment was begun. Often physicians ignore the clinical diagnosis and risk a human life by withholding treatment until diagnosis is upheld by the laboratory.

Kentucky

New State Veterinarian Appointed.—The State Board of Agriculture has named Dr. B. F. Pigg, of London, state veterinarian, to replace Dr. L. L. Breeck who will be retained as assistant for a period of four months, as a reward for long service. Dr. Breeck has been in the state service for twenty years, the last four as state veterinarian. His successor is a former captain in the National Guard and was a member of the State Board of Veterinary Examiners from 1927 to 1938. He was graduated at the Cincinnati Veterinary College about thirty-one years ago.

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First Whirl—Famous Foal.—What seems to be the happiest event in horsemanship is the birth of the first son of Whirlaway at the Calumet Farms in October. Whirlaway, champion money-winner of all time, was retired to the stud in 1943, but no offspring was expected until 1945. So, the birth of a son by him in October, 1944, came as a surprise, since few Thoroughbred mares come in season in November for the delivery of October foals. The dam of First Whirl—its baptismal name—is the royally bred mare, Mary V, property of Dixiana Farms near Lexington, owned by C. F. Fisher of autobody fame. Officially, First Whirl was a year old Jan. 1, 1945, and will, therefore, be but 15 months old, if entered in 2-year-old races Jan. 1, 1946.

Maine

State Association.—Announcement of the annual meeting at Hallowell, for Jan. 17, 1945, and report of the October meeting are given as follows in *Quarterly News Letter*, S. D. Merrill, editor:

Harry S. Keener, Ph.D., Department of Dairy Husbandry, University of New Hampshire: "Cobalt Deficiency in Dairy Cattle in New Hampshire."

C. M. Merrill, South Paris: "Chronic Brucellosis, a Health Hazard to the Veterinarian."

A sound and color film on "Vesicular Diseases of Animals," and sound films on "Body Defenses Against Disease," "Heart and Circulation," and "Nervous System," are scheduled.

The October meeting was an outdoor clinic at the Lewiston fairgrounds. A bilateral crip-

torchid horse was castrated by S. W. Stiles, assisted by S. D. Merrill, R. F. Vigue, and H. N. Eames A scrotal hernia in a small pig "was corrected," L. B. Denton, assisted by J. F. Witter and G. M. Potter An advanced case of "seedy toe" in a horse presented by E. C. Moore was discussed as to treatment and prognosis Rumenotomy was performed on a cow under epidural and chloral anesthesia, by R. E. Ingham, assisted by Witter, Houle, Dutton, and Potter A debarking operation was performed on a dog under pentobarbital anesthesia. Result: "bark" to "woof," the reporter writes Talks and demonstrations on mechanical milker featured the postprandial hour.

Graduate Course.—Twenty-five veterinarians attended a two-day course in Portland, November 29 and 30, on "Sterility in Dairy Animals," conducted by M. G. Fincher, New York State Veterinary College, Cornell University, under the direction of S. D. Merrill. Four subjects were taught; namely, (1) diagnosis, (2) physiology of reproduction and the rôle of hormones and vitamins in reproduction, (3) pathology and diagnosis of some infections of cows and bulls, and (4) examinations and demonstrations of abattoir specimens of reproductive organs followed by talks on the prevention and treatment of sterility in both sexes.

Practitioners' Round Table.—Maine and New Hampshire veterinarians met at Falmouth Foreside, November 9, to discuss apple poisoning in cattle and horses, caused by eating windfalls following the September hurricane. The incidence, symptoms, chemistry, postmortem lesions, and treatments were discussed.

Dairy Meetings.—At meetings with dairymen, held at Farmington, South Paris, and Gorham, during the week of December 11, J. F. Witter gave a series of talks on mastitis, outlining the high cost of that disease and the course of treatment and prevention to pursue.

Massachusetts

State Association.—The regular monthly meeting for November drew a sizable audience including a number of veterinary officers. The program, besides a short business session, included:

Charles M. deVarennes: "Cecectomy in the Dog," reviewing the surgical anatomy, indications, technique, and the benefits derived in four cases.

Leo Weisz: "Colics in the Horse," pointing out the significance of symptoms in establishing a diagnosis of the underlying cause, and outlining treatment for the different types, including the operative treatments which lower the mortality.

Martin M. Kaplan: "Listerellosis in a Goat," recalling that Massachusetts pioneered in laboratory diagnosis of that disease. Symptoms in the different animals were reviewed.

The following program was announced for the December meeting—a dinner session at Hotel Vendome, Boston, on the evening of December 20, 1944:

R. Fröhlich: "Everyday Occurrences in Large Animal Practice," with color slides.

G. B. Schnelle: "Army Dogs from the Veterinarian's Standpoint" (illustrated).

s/ H. W. JAKEMAN, *Secretary.*

Michigan

Institute of Nutrition.—Michigan State College has founded an intramural organization to coördinate and integrate instruction and research in nutrition, for "the betterment of mankind." The organization will be known as the Institute of Nutrition. The aim in addition is to supply contact between industry and the college, to supply industry, the consumer, and the farmer with the results of its work, and to establish the college as a research center on foods and nutrition.

Army-Navy "E" to Upjohn's.—The Information Division of the Office of the Surgeon General has announced, as of Nov. 24, 1944, the awarding of the Army-Navy "E" to the Upjohn Company, of Kalamazoo, for an "excellent production record in supplying vital pharmaceuticals for the armed forces." The presentation speech was made by Lt. Col. J. G. Nob, director of the Army Medical Purchasing Office, New York City.

Minnesota

County Tuberculosis Control Work—Human.—When Martin County was accredited by the state Department of Health for the control of human tuberculosis, it was the ninth county in the state to receive that recognition. The tuberculosis mortality of Martin County for the last five years has been 3.2/100,000 and the infection rate among high school seniors less than 7 per cent. To be accredited, a county must show a death rate of less than 10/100,000 and a morbidity rate of less than 15/100,000.—*J.A.M.A., Dec. 21, 1944.*

New Jersey

State Association—An Echo of the 1941 Meeting.—In reflecting over important addresses by national leaders, the Forum on Current Problems of the *New York Herald-Tribune* of October 23, points out the one made before our association by Dr. Rene J. DuBos in January, 1941. The title was "Gramicidin, a Bactericidal Substance Selective for Gram-Positive Microorgan-

isms" wherein he stressed its possibilities in the treatment of mastitis and other infections of cattle. "Of interest to the veterinarian" the columnist said. This is the type of comment veterinary medicine appreciates, the kind that improves our public relations.

s/J. R. PORTEUS, *Resident Secretary.*

New York

Cornell Conference.—The annual conference for veterinarians, held at New York State Veterinary College, Jan. 3-5, 1945, was the thirty-seventh consecutive refresher course on veterinary medicine given by Cornell University. Of the 22 guest speakers on the program, 10 were practitioners. Panel discussions were conducted on small animal practice, poultry-disease control, mastitis, brucellosis, and dairy-cattle practice. From out of the state came Bramer of Illinois, Doyle of Purdue, Farquharson of Colorado State, Nichols of the Mayo Clinic, Miller of Pennsylvania State, Rife of Atlanta, and Sippel of California. Special subjects listed on the announcement were the Singer suture instrument, dog neoplasms, rabies, the small animal practitioner and his clients, equine infectious anemia, hog-cholera vaccine and the diagnosis of hog cholera by gall-bladder smears, sixty-five years in the veterinary profession, penicillin, drying up diseased udder quarters permanently, and mastitis and the practitioner. "Greetings from the University" by President Edmund E. Day of Cornell, "Veterinarians in Action" by Dean William A. Hagan of New York State Veterinary College, and "The American Veterinary Medical Association" by President James Farquharson were the attractions of an evening session held in the Memorial Room of Willard Straight Hall.

Veterinary Medical Association of New York City, Inc.—The Association met at the Hotel New Yorker, Dec. 6, 1944. A demonstration of the use of the Singer surgical stitching instrument was presented, by means of motion pictures, by Mrs. Emma Rogers and Mr. C. O. Wright, demonstrators of the Singer Sewing Machine Company.

Following the program a minute of silence was observed in memory of the late Dr. Herman Kock.

The officers elected for 1945 are E. R. Cushing, *president*; Leonard Goss, *vice president*; C. R. Schroeder, *secretary-treasurer*. The board of censors, composed of representatives from the various counties, includes New York, C. G. Rohrer; Bronx, Jacob Lebish; Queens, A. A. Livingston; Kings, Henry E. Grossman; Richmond, J. L. Halloran; Westchester, Samuel M. Appleby; Nassau and Suffolk, J. S. Crawford; and New Jersey, Joseph R. Engle. The execu-

tive board elected Samuel Shindell, Joseph Engle, and Robert S. MacKellar.

Capt. Mark Sternfels gave a detailed account of his two years service in the India-Burma-China theater and the part the Veterinary Division is playing in this war.

s/C. R. SCHROEDER, *Secretary-Treasurer*

On Dec. 12, 1944, five fourth year students of the New York State Veterinary College were elected to Phi Zeta Society of Cornell. They are: Wm. J. Halfleigh, Howard Harmon, Russell F. Greer, Jos. C. Shaffer, and Ralph F. Wester. One third year student, Robert F. Shigley, was also elected. Dr. Wm. H. Boynton, Division of Veterinary Science, University of California, was elected as an honorary member of the Society.

s/HELEN M. DOREMUS,
Secretary-Treasurer, Phi Zeta

Proposed Memorial for War Dogs.—The Gaines Dog Research Center, of Gaines Food Company, Inc., Sherburne, announces the awarding of a prize of \$500 for the person who suggests the most appropriate design for a memorial commemorating the services of the dogs of the K-9 Corps, U. S. Army. Suggestions should be sent to Harry Miller, Executive Secretary, Gaines Dog Research Center, 250 Park Avenue, New York City. The design will be chosen by prominent figures of dog fancy. The site proposed for the memorial is the grounds of the Pentagon Building, Washington, D. C., the building that houses the War Department.

Malaria Immunization.—According to current rumors, the Public Health Institute of New York City has successfully immunized animals (kind not stated) against malaria. The details are a military secret. Thus, the greatest medical achievement of all history is in the offing. Malaria is by far the greatest of human scourges, taking a greater toll in man hours than all other diseases combined.

New York City Association.—Assistant Chief Gerry B. Schnelle of the Angell Memorial Hospital, Boston, spoke on "A Veterinarian's View of the War Dog" at the monthly meeting held at Hotel New Yorker, January 2, 1945.

National Research Council Honored.—At the annual meeting of the American Pharmaceutical Manufacturers Association held at the Waldorf-Astoria, New York City, in December, the National Research Council was chosen to receive the Association's sixth annual award "in recognition of its fundamental contribution to public health."

Personal.—C. E. Bolton (Corn., '26), federal veterinarian, recently moved from Binghamton, N. Y., to engage in tuberculosis and brucellosis eradication work. Dr. Bolton resides in Montpelier, Vt.

North Dakota

State Association.—The following program was announced for the fortieth annual meeting in Bismarck, on Jan. 15, 1945:

C. R. Donham, Head, Department of Veterinary Science, Purdue University: "Brucellosis in Cattle," and "Brucellosis in Swine."

W. E. Petersen, Professor of Dairy Husbandry, University of Minnesota: "Physiology of Milk Secretion and Its Relations to Mastitis."

Frank Breed, Norden Laboratories, Lincoln, Nebr.: "Hog Cholera and Its Complications," and "Swine Erysipelas."

Guy Railsback, Mankato, Minn.: "Vaccines in the Prevention of Hog Cholera."

M. H. Roepke, Veterinary Division, University of Minnesota, University Farm, St. Paul: "Sulfa Drugs."

M. R. Benson, Grand Forks, N. Dak.: "Small Animal Practice."

Fred C. Driver, Bismarck: "Brucella Abortus Vaccine in the Control of Brucellosis in North Dakota."

s/ J. O. FOSS, FARGO, *Secretary-Treasurer.*

Ohio

P. T. Engard, practicing veterinarian of Marysville, Ohio, was the "Keep 'em Healthy" guest on the station WLW "Everybody's Farm Hour," broadcast on January 20 at 11:30 a. m., CWT.

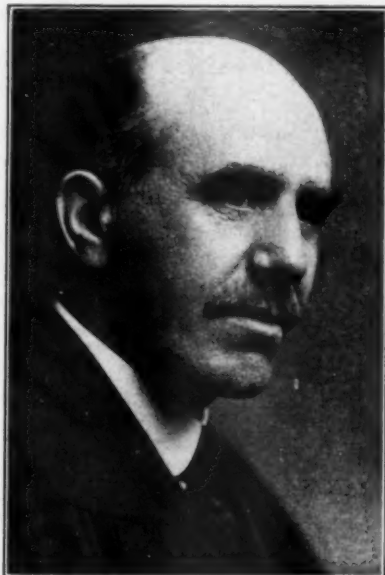
His topic on the WLW livestock health program, presented with the coöperation of the Veterinary Medical Associations of Ohio, Indiana, and Kentucky, was "Pregnancy Disease."

Ontario

Ontario's Fourth Principal.—Since the Ontario Veterinary College, University of Toronto, was founded in 1862, it has had but three principals [deans], Andrew Smith, the founder, A. A. E. Grange, and C. D. McGilvray who, on retirement June 15, 1945, will be succeeded by Andrew L. MacNabb (Ont., '23), director of the Provincial Department of Health, and a prominent figure in the research field and public health circles. In addition to serving as principal of the college, Dr. MacNabb will continue as supervisor of animal health of the provincial government's farms and stockyards, and will carry on for the Provincial Health Department in the rôle of consulting director of the laboratory service.

Dr. MacNabb's activities have been vigorous, constant, numerous, and important to agricul-

ture and public health in the Province of Ontario and from these came international acclaim for work well done in various fields (ty-



Dr. C. D. McGilvray

phoid fever, septic sore throat, milk-borne paratyphoid fever, undulant fever, psittacosis, tuberculosis, dietetics, and syphilis). The new principal-elect is a fellow of the Toronto Academy of Medicine, and the American Public



Dr. Andrew MacNabb

Health Association, a member of the American Society of Immunologists, and the Ontario Veterinary Association, and is listed in Who's

Who in Canada. He is associate in Biometrics and Epidemiology, School of Medicine, University of Toronto, and a referee for the Laboratory Diagnosis of Tuberculosis, American Public Health Association. He was an enlisted man in the 11th Field Ambulance of the Canadian Army in World War I and of the Forestry Corps (in France, 1916-1919). In World War II, it's Lt. Col. MacNabb, laboratory consultant, with duty in Labrador where he investigated outbreaks of diseases.

When this pioneer institution, with its large number of alumni scattered all over the continent and many other parts of the world, takes on a new principal, that's news. So, many gray-heads will ask "What sort of a chap is MacNabb? In answer, let's quote our informant: "He is on top of the top drawer among scientists and research workers, yet he is never happier than when in an up-to-date dairy barn talking pedigree and milk performance with the herdsman. He is a Scotsman, born in Ontario in 1897. A short time ago, he bought a bull for \$1,000, gladly "knocked down" by the auctioneer on account of a lame leg. A year later, Dr. MacNabb refused a \$12,000 offer for the animal. What's a little claudication to a Scotsman who knows veterinary medicine? Moreover, while basking in the sunshine of his achievements in human health, he never forgot he was a veterinarian, and when there was a government appointment of a meat or milk inspector, a veterinarian always got the job. The Doctor is a good mixer with a keen sense of humor, who is looking forward with enthusiasm over the honor of becoming principal of North America's oldest veterinary college. The Minister's appointment is popular."

s/L. A. MERRILLAT, President,
O. V. C. Alumni Association.

Saskatchewan

Veterinary College for the Western Provinces.—When the provincial association met at the University of Saskatchewan in October, the proposal to establish a veterinary faculty for the western provinces of the Dominion was discussed. The matter had been discussed by officials of the three prairie universities concerned (Alberta, British Columbia, and Saskatchewan) and the provincial university at Saskatoon appeared to be the logical site. Commenting on the proposal before the Veterinary Association of Saskatchewan, President J. S. Thompson of the University, remarked that no definite steps could be taken during the war but that when the time is ripe for founding such an institution, it must be a first class one wherein the students shall comply with the discipline and standards of the other departments.—*From the Canad. J. Comp. Med. and Vet. Sci.*, 8, (Nov. 1944): 325.

Texas

Personals—W. Cecil Butler, has resigned as head of the scientific and research work of the Globe Laboratories to take charge of the recently created animal and farm products division of McKesson & Robbins, wholesale drug firm of New York and Chicago.

Major Gilbert Horning (McK., '13), prominent small animal practitioner of Houston, has been transferred from Washington, D. C., to the India-China theater. Dr. Horning entered the military service early in 1942.

Major Floyd Watts (Tex. '39), former practitioner of Littlefield, is a technical advisor for the Army Air Corps at Yale University. He was invalided home in 1943 after having been shot down in an action over France.

Capt. Abe Levy (Tex., '38) has been on duty with troops in Australia for nearly two years. —*Notes from the Texas Veterinary Bulletin*, November, 1944.

Vermont

Personal.—Wesson D. Bolton (M.S.C., '44) recently located for practice in his native town of Cabot, Vt. Dr. Bolton's father, Dr. Ray B. Bolton, veteran of World War I, has held the position of state or federal veterinarian since his release from military service. He is now in charge of the Vermont brucellosis laboratory.

Vermont is now doing an extensive amount of brucellosis testing and calf vaccination. The shortage of veterinarians has made it necessary to stress the calf vaccination. Even though little tuberculosis exists, enough is in evidence to require proper vigilance and the state tests one of the three sections into which it is divided every year.

s/G. N. WELCH.

Foreign

England

Brucella Vaccines.—Strain 19 vaccine is called Minister's No. 1 vaccine. Farmers are charged one shilling per calf and the work is done when a veterinary inspector visits the farm for the purpose of inspecting the herd. Experience in Britain has shown that this vaccine is effective in heifers vaccinated later in life than calfhood. In England and Wales, the use of live *Brucella abortus* vaccine, which was previously limited to infected herds licensed for the production of tuberculin-tested milk, may now be used in these herds both for heifer calves and adult cows whether the herd is infected or not. In Scotland, with the consent of the local authority, herds licensed for the

production of certified or tuberculin-tested milk may be thus vaccinated. The vaccination is conducted on a voluntary basis under stated regulations issued to registered dairy farmers Dec. 1, 1944.—*From the Veterinary Record.*

[Obviously, the brucellosis campaign is off on the right foot in Britain. "With the consent of the local authority" is a contrast to strain 19 at the corner drug store.—Ed.]

France

Dr. Pierre Blaizot, one of the French members of the Franco-American Veterinary Liaison Mission of World War I, who will be recalled by many American veterinary officers of that period, writes after four years of silence that he and his family "have fared better than some of their neighbors." Dr. (Lieut.) Blaizot spent two years in this country with a French horse purchasing board, preceding our declaration of war against the Central Powers. He is manager of a large veterinary supply house in Paris and a not-so-small biological laboratory in Normandy—Laigle (Orne), near the badly battered city of Caen. Before World War I, he conducted a pretentious veterinary hospital and horseshoeing shop for the swank Parisian horsemen near the *Arc de Triomphe*. Proof of his faith in Americans is that Dr. Blaizot adds: "Be sure to send me the back numbers of the Journal—1939 to 1944—as soon as conditions permit." The curious may see his picture in *Veterinary Military History*, Vol. II, p. 683.

COMING MEETINGS

New Jersey Veterinary Medical Association. Hotel Sheraton, Newark, N. J., Jan. 30-31, 1945. J. R. Porteus, P. O. Box 938, Trenton 5, N. J., secretary.

Kentucky Veterinary Medical Association. Agricultural Experiment Station Farm, University of Kentucky, Lexington, Ky., Feb. 1-2, 1945. F. M. Kearns, 3622 Frankfort Ave., Louisville 7, Ky., secretary-treasurer.

Louisiana Veterinary Medical Association. Dalmryple Bldg., Louisiana State University, Baton Rouge, La., Feb. 8-9, 1945. C. M. Heflin, 2130 Tulip St., Baton Rouge 11, La., secretary-treasurer.

Southern California Veterinary Medical Association. At the hospital of Dr. N. L. McBride, Jr., 845 S. Arroya Parkway, Pasadena, Calif., Feb. 21, 1945. Clinton M. Baxter, 803 Lindaraxa Pk., N. Alhambra, Calif.

American Veterinary Medical Association. Eighty-second Annual Meeting. Palmer House, Chicago, Ill., Aug. 21-24, 1945. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

American Public Health Association. Hotel Stevens, Chicago, Ill., Sept. 17, 1945. R. M. Atwater, 1790 Broadway, New York 19, N. Y., executive secretary.

United States Live Stock Sanitary Association. LaSalle Hotel, Chicago, Ill., Dec. 5-6-7, 1945. R. A. Hendershott, 1 W. State St., Trenton, N. J., secretary-treasurer.

Cancelled or Indefinitely Postponed

Nebraska Veterinary Medical Association, Lincoln.

Texas Veterinary Medical Association, Houston. Alabama Polytechnic Institute, Short Course for Veterinarians, Auburn.

Colorado A. & M. College, Annual Conference for Veterinarians, Ft. Collins.

American Animal Hospital Association, New York, N. Y.

DEATHS

Miller F. Barnes (U. P., '11), 56, Lemoyne, Pa., died Dec. 8, 1944. Dr. Barnes retired from the Pennsylvania Bureau of Animal Industry on Oct. 1, 1943, after twenty-seven years of active service, of which nearly fifteen were as chief of the laboratory service. (*see the JOURNAL*, December, 1943, pp. 404-405.) Dr. Barnes was well known for his work on bovine brucellosis in particular and for his development of the Pennsylvania plan for the control of that disease.

Frederick William Cruickshanks (Corn., '18), Hagerstown, Md., died Dec. 12, 1944. Dr. Cruickshanks had practiced in Hagerstown for twenty-five years.

Frank M. Gallivan (Ind., '14), 56, Fort Worth, Tex., died Jan. 2, 1945. Dr. Gallivan was vice-president and director of the Globe Laboratories at the time of his death. He had been a member of the AVMA since 1933.

Samuel E. Lloyd (Amer., '93), 70, Buffalo, N. Y., died Aug. 6, 1944. Dr. Lloyd was admitted to the AVMA in 1894.

James A. MacPhail (Gr. Rap., '04), 67, Manistique, Mich., died Jan. 6, 1945. Dr. MacPhail was admitted to the AVMA in 1926.

John L. Masson (San Fran., '09), 66, Eureka, Calif., died Dec. 20, 1944. Dr. Masson was admitted to the AVMA in 1917.

Joseph Ralph Morin (Ont., '13), 59, Rockville, Conn., died Nov. 15, 1944. Dr. Morin was admitted to the AVMA in 1934.

C. T. Norman (K.C.V.C., '11), 59, Portland, Ore., died March 3, 1944. Dr. Norman located in Portland twenty-one years ago where he owned and operated the first small animal hospital in that city. He had been a member of the AVMA since 1939.

THE VETERINARY PROFESSION AND THE WAR

Veterinary Officers Decorated for Meritorious Service

On October 16, 1944, Major Richard T. Gilyard (Corn.'35), of Waterbury, Conn., received the Legion of Merit Award for "his exceptionally meritorious work in inaugurating a vigorous campaign to eradicate encephalomyelitis on the island of Trinidad, B. W. I.". Dr. Gilyard was en-

of life was reduced to a minimum. Major Gilyard, in this campaign, also saved many thousands of dollars for the civilian inhabitants of Trinidad, who own horses, mules and donkeys. In his zeal and compelling sense of duty, Major Gilyard was tireless. In his efforts, in the field, collecting mosquitoes from animals sick and dying of encephalomyelitis, he displayed a self-sacrificing attitude, knowing well that were he to contract the disease it would most certainly cause his death or permanent disability.

Major Gilyard entered the service 9 March, 1942, from Connecticut.

Colonel William H. Dean (U.P.'17) was decorated with the Legion of Merit Award by Major General Leroy Lutes for "exceptionally meritorious conduct" in molding an unusually effective administrative supply organization in the North African theater



Major Richard T. Gilyard

gaged in practice with his father, Dr. Arthur T. Gilyard, in Waterbury in the large animal field prior to the war. The citation follows:

MAJOR RICHARD T. GILYARD, 0-311012, Veterinary Corps, Office of the Surgeon. For exceptionally meritorious conduct in the performance of outstanding services in inaugurating a vigorous campaign to eradicate equine encephalomyelitis on the island of Trinidad, B.W.I., during the period 1 October, 1943 to 20 January, 1944. This campaign was expertly organized and guided by Major Gilyard, and because of its vigorous handling, civilian and military loss



Colonel William H. Dean

of operations, U. S. Army, and his later work at Anzio and in Italy. The citation follows:

WILLIAM H. DEAN, 09888, Colonel, General Staff Corps, Headquarters, Services of Supply, North African Theater of Operations, United States Army, for exceptionally meritorious con-

duct in the performance of outstanding services during the period 15 December, 1943 to 26 May, 1944. As head of the Operations Section and later as Assistant Chief of Staff, G-4, Headquarters, Services of Supply, North African Theater of Operations, United States Army, he molded a highly effective administrative supply organization from a limited staff. Under his determined and skillful direction, supplies were invariably available when needed by the combat forces both during the successful amphibious operations at Anzio and later as Fifth Army moved forward in Italy. By his seasoned judgment, keen insight, superior administrative capacity, and resolute devotion to duty, Colonel Dean has rendered significant service to his country so as to reflect credit upon himself and the Army of the United States. Entered service from Pennsylvania.

Dr. Tunncliff Returns from Special Mission to China

Dr. Everett A. Tunncliff has just returned from China, where for the past year he has been serving as advisor to the Chinese Minister of Agriculture and Forestry, at his request, under the program of cultural coöperation of the Department of State, as a specialist in the field of veterinary science.

On his way to China, Dr. Tunncliff visited the veterinary college and the animal-disease-control station at Madras. At the Bengal animal-disease-control laboratory at Calcutta, Dr. Ali, director of the laboratory, gave him a culture of virus, which Dr. Tunncliff used in China to produce a new and much cheaper type of vaccine for the control of rinderpest in cattle. The Government of India requested him to stop in India, on his return from China, to consult with the scientists of various Indian institutions concerning their own problems in animal-disease control.

During his year's stay in China, Dr. Tunncliff had an unusual opportunity to travel widely in China studying the diseases of animals in various parts of the country and helping to reorganize the animal-disease-control program. He visited the various veterinary colleges and made suggestions for a revised curriculum in veterinary science. He also taught a post-graduate course at Lanchow in Kansu province.

On his return journey, Dr. Tunncliff visited the Ondertepoort Laboratories near Pretoria, Union of South Africa.

Dr. Tunncliff will return to his duties as associate pathologist at the Montana Veterinary Research Laboratory, Bozeman, Mont.

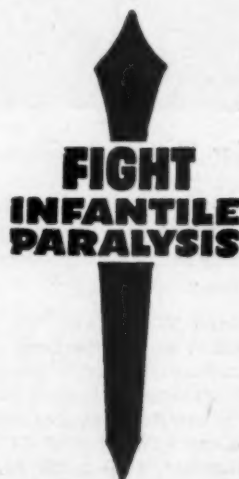
Veterinary Unit Honored

The Meritorious Service Unit Plaque was awarded to the 1745th Service Command Unit (Veterinary Service) of Fort Omaha, Neb., by the commanding general of the Seventh Service Command, "for superior performance and outstanding devotion to duty in connection with food inspection activities." The citation reads as follows:

AWARD—Meritorious Service Unit Plaque—Announcement is made of the award of the Meritorious Service Unit Plaque, by the Commanding General, Seventh Service Command, on 18 December, 1944, to the Medical Detachment (Veterinary Service), 1745th Service Command Unit, Fort Omaha, Nebraska, for its superior performance and outstanding devotion to duty in connection with food inspection activities of this command, during the past two years. This unit achieved and maintained a high degree of military and professional efficiency throughout a period of two years as evidenced by superior individual conduct of its personnel, high esprit de corps, its superior overall administrative record combined with outstanding discipline and morale.

By command of Major General DANIELSON:

P. X. ENGLISH,
Brigadier General, GSC,
Chief of Staff.



JAN. 14-31

DEAR DOCTOR:

It has been thirteen years since *Brucella Abortus Vaccine* prepared from B. A. I. Strain 19 came into general use. The ever-increasing use of this agent by veterinarians in the control of brucellosis in cattle is adequate proof of the success of proper calfhood vaccination.

During the last several years much has been learned about this agent and its use. The following points having outstanding significance:

1. It is now recognized that this agent has a wider scope of usefulness than formerly recommended, being useful for calfhood vaccination in all herds, whether infected or not. It is also useful for vaccination of adult cattle under some conditions. (Report of Chief of U. S. Bureau of Animal Industry read before December 1944 meeting of U. S. Livestock Sanitary Association.)
2. It becomes increasingly clear that in the future animals properly vaccinated will have greater value than non-vaccinated animals. The necessity for proper identification and recording of all vaccinated animals is self-evident. Carefulness in this respect by veterinarians will do much to eliminate indiscriminate lay vaccination.
3. It is important to use fresh vaccine containing an adequate number of living organisms. Veterinarians are urged to purchase this product for immediate, known needs only, and to inject only vaccine which is well within its expiration date. Proper handling and refrigeration of this agent are extremely important.

The continuous schedule of production of *Lockhart Brucella Abortus Vaccine* enables us to supply fresh vaccine at all times. It is rare that we ship vaccine which is more than thirty days old. The required expiration date is ninety days, and approximately fifteen days of this time is consumed in our own and U. S. Bureau of Animal Industry tests before the product can be released for market.

Yours very truly,

ASHE LOCKHART, INC.

WHETHER ON RANGE OR DAIRY FARM

Jen-Sal Brucella Abortus Vaccine

Calfhood vaccination, together with selective use of vaccine on adult animals in problem herds — both under strict veterinary supervision — are the essential keystones of brucellosis control.

Jen-Sal Brucella Abortus Vaccine is prepared from smooth strains only of B. A. I. Strain 19 *Brucella abortus*. All steps in preparation, including final bottling, feature use of alkaline-free glass.

Supplied to qualified veterinarians only, Jen-Sal Strain 19 Vaccine is also backed by a campaign of ethical advertising in leading dairy breed papers, including *Hoard's Dairyman*.



Vaccination Certificate Books
and Vaccination Reminder Cards
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Vial 6 cc. . . . \$0.30
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Pkg. 6-6 cc. . . \$1.56
Code: BORSEX

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